Aneka Tutorial

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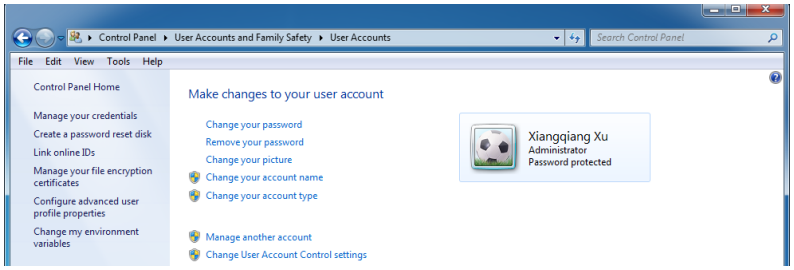
1. Aneka platform download: see the attached **Aneka.3.0.msi.**
Or you can register online and download from the following link:
http://www.manjrasoft.com/manjrasoft_registration.php

The installation guide is available to download here:
(I suggest you use the latest version: Aneka 3.0 which is a free evaluation version)
http://www.manjrasoft.com/download/3.0/AnekaInstallationGuide.pdf

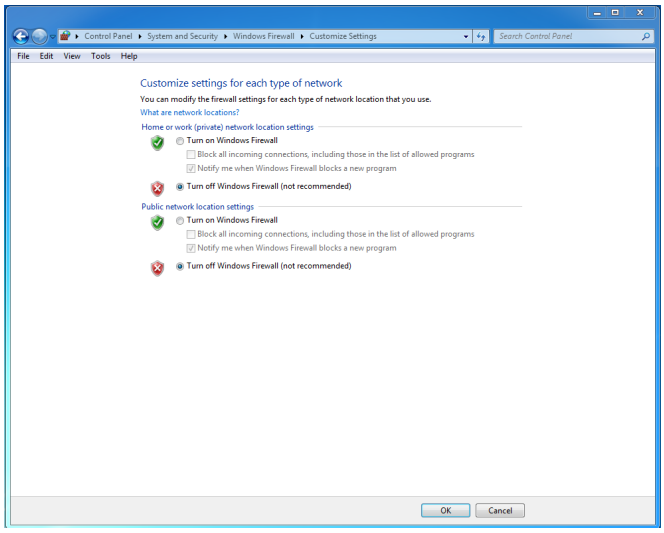
Aneka User Documents & Programming Model Example Code:
http://www.manjrasoft.com/manjrasoft_downloads.html

2. Use windows 7/8, or Windows Server 2008/2012 as your OS environment.

3. Before installation, make sure that you are a full control administrator, looks like this:

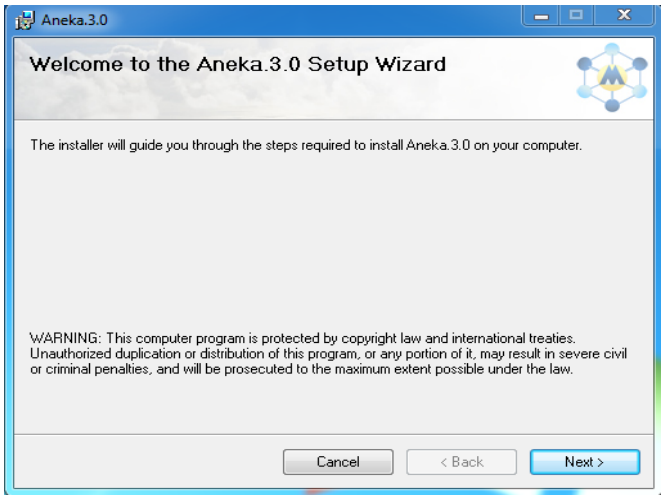


Turn off your firewall on both private network and public network as well:

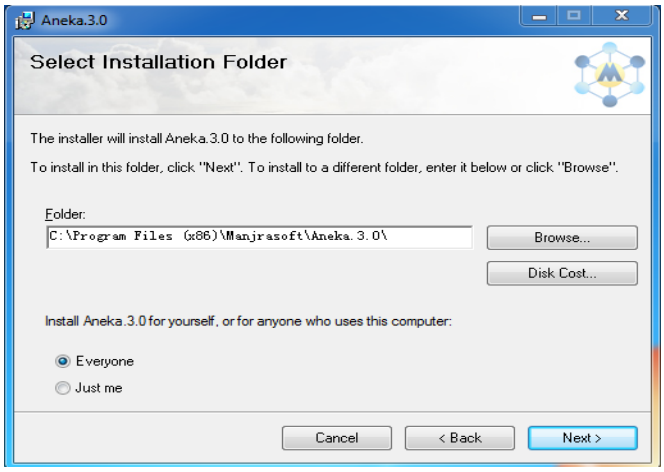


4. Installation Steps:

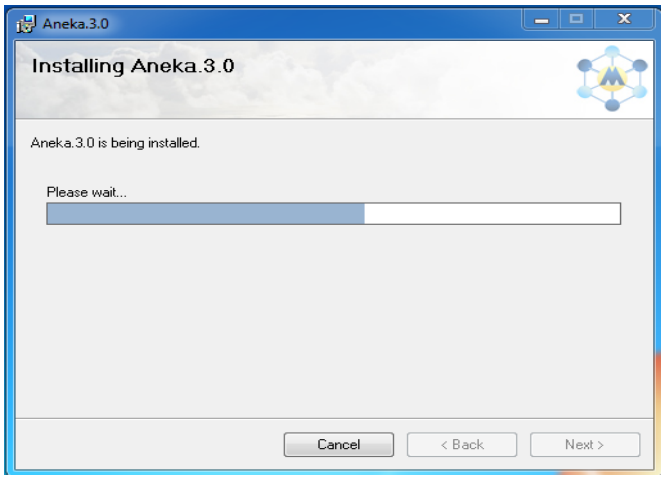
Double click **Aneka.3.3.msi,** and then this should show up:



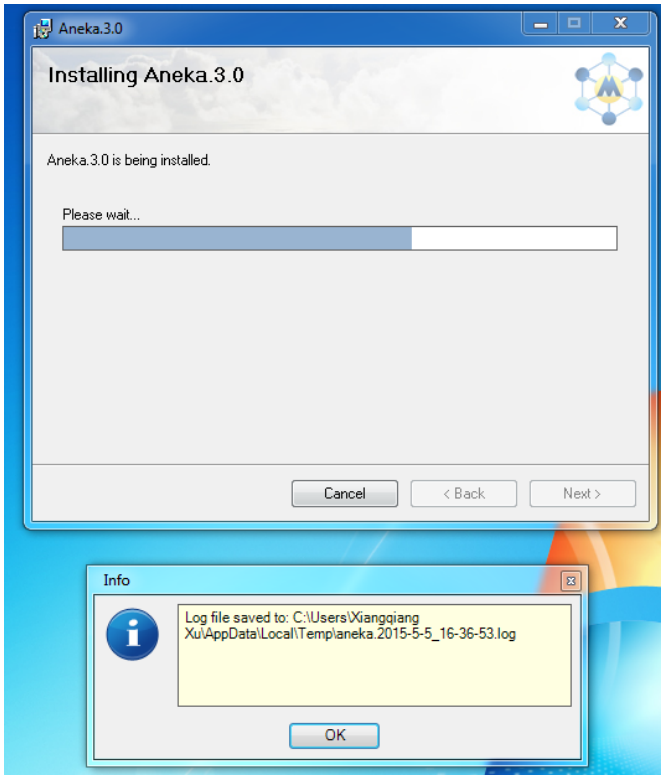
Click Next, I recommend you choose **Everyone** instead of **Just Me**.



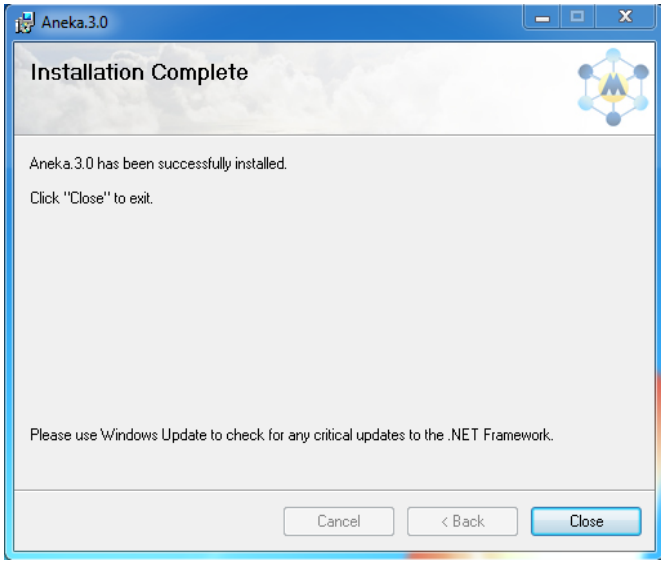
Click Next, and wait for installation, it might take couple of seconds:



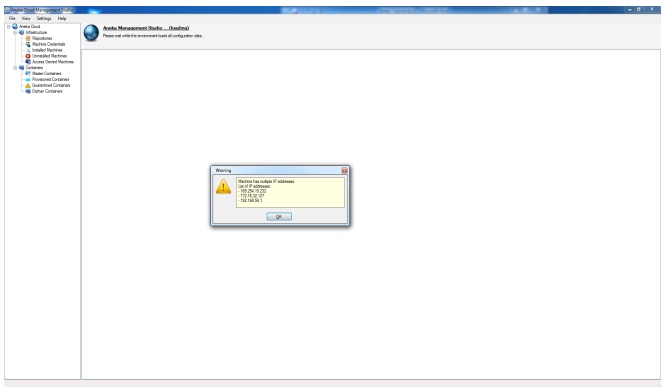
When the **Info** form pops up, click **OK**:



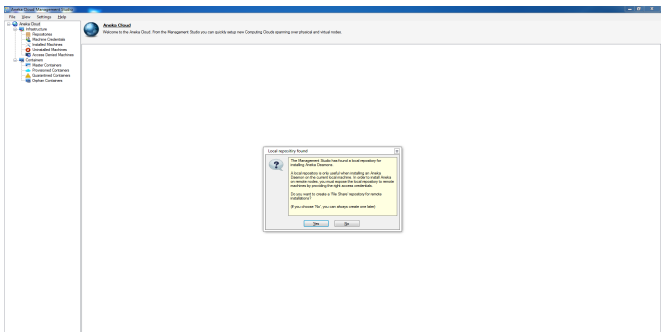
Installation Complete, click **Close** to finish:



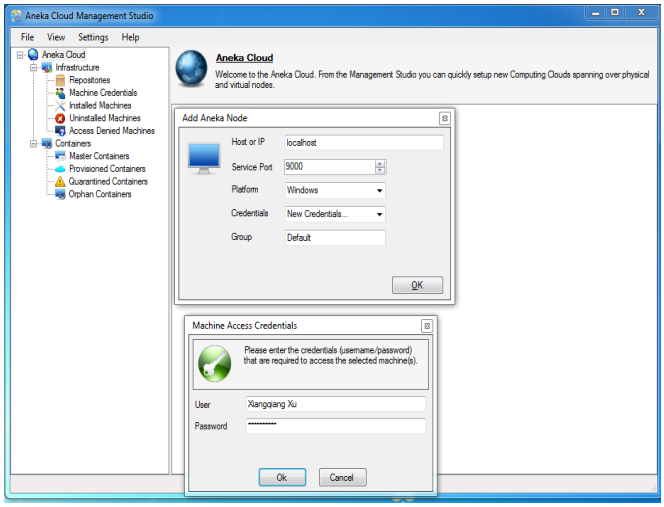
5. Launch Aneka Platform, I suggest that you can create a shortcut, so you do not have to search and click the icon every time you use. Click **OK** to continue.



Click **NO** to continue, we can configure our local repository later.



Click File→ Add Machine…



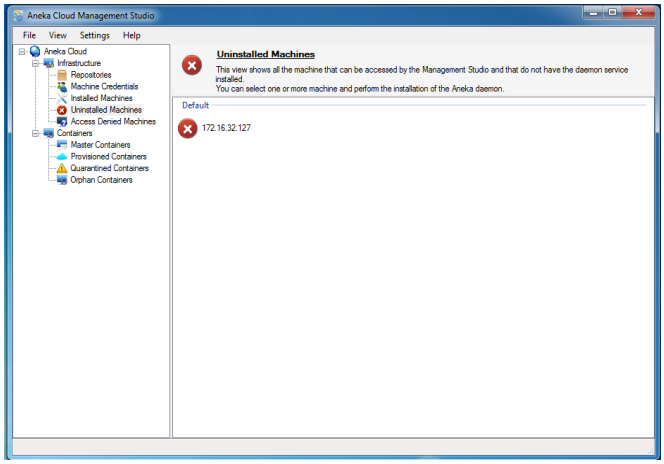
Host or IP: fill in **localhost**

Service Port: **9000**

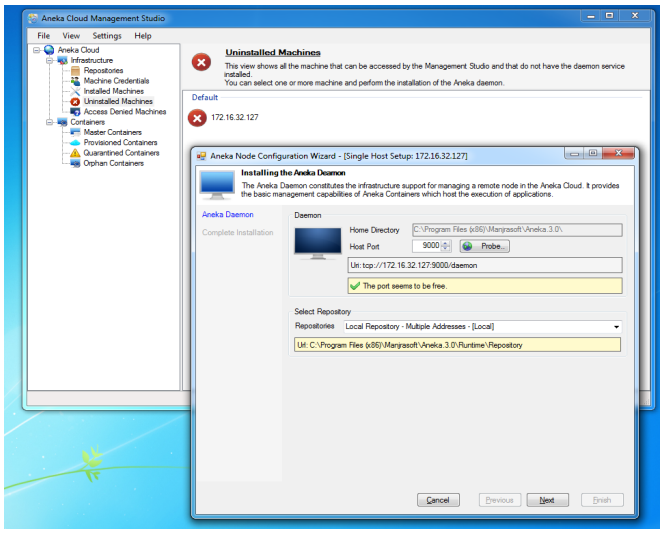
Platform: **Windows**

Credentials: In my case, **User Name: Xiangqiang Xu** **User Password: ******

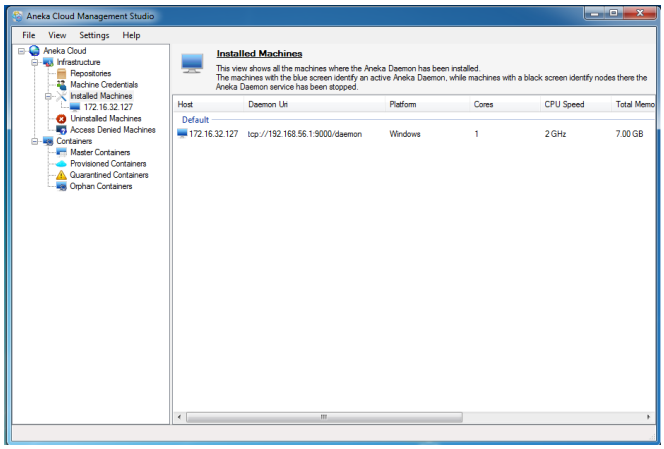
Click **OK** to continue. When you click Uninstalled Machine, you will see a similar case as below:



You need to install the machine on Aneka and configure it. Click the icon → right click → install



Then click **Next**, and then click **Finish.** It might take a few seconds to complete this step.

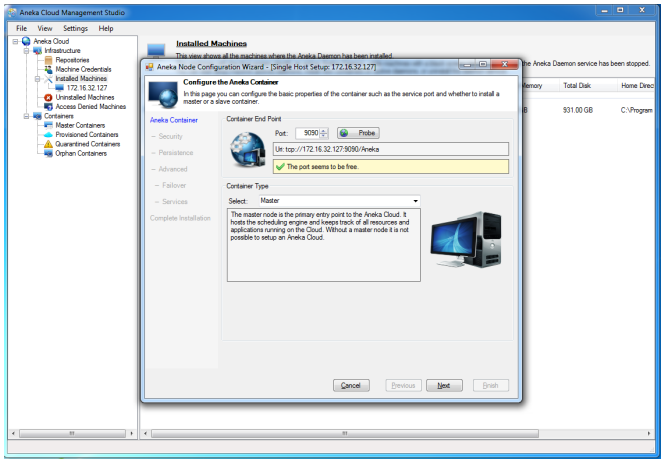


This is an example to show you how to add local machine to our Aneka cloud. We can also add other machines **within the same network**. (Make sure that can ping with each other successfully)

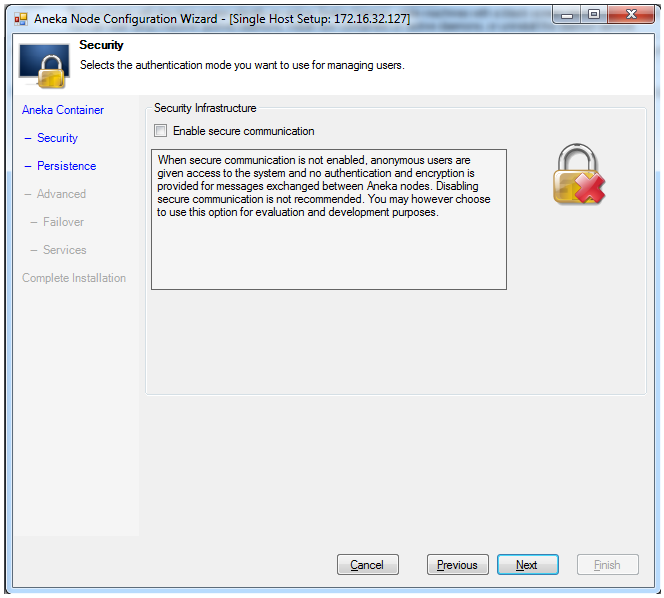
6. Install Master-Worker container.

6.1. Install one machine as both master container node and worker container node.

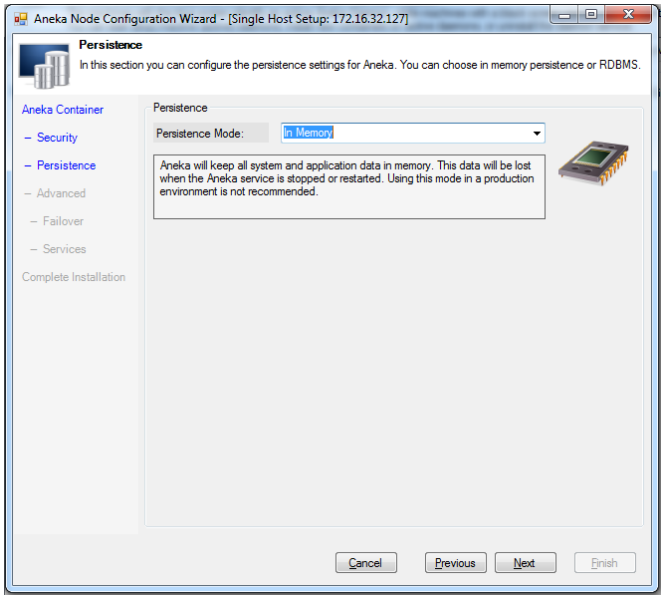
Click the host machine icon, and right click, then choose **Install Container**.



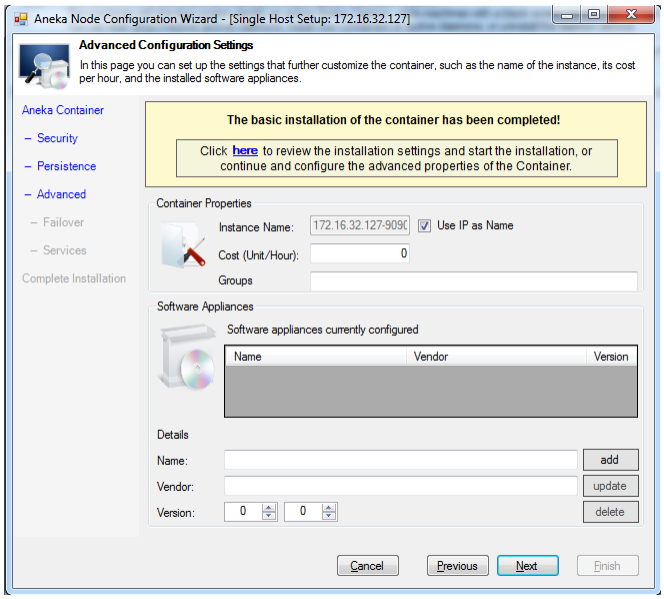
Click **Next**.



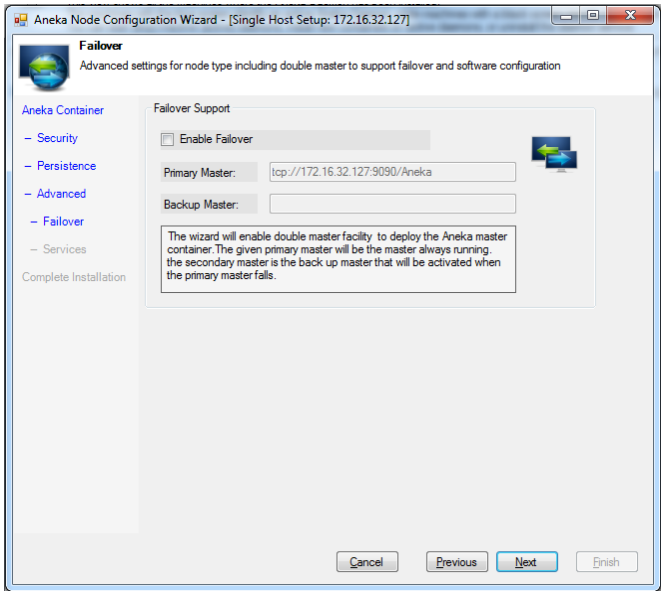
Click **Next**, and choose Persistence Mode as **In Memory**.



Click **Next**, do not worry about those blanks, you can just leave them blank there.

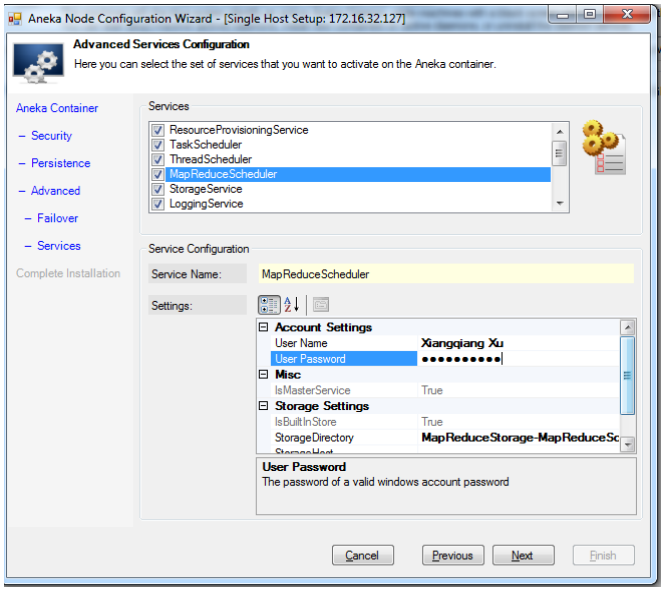


Click **Next**.

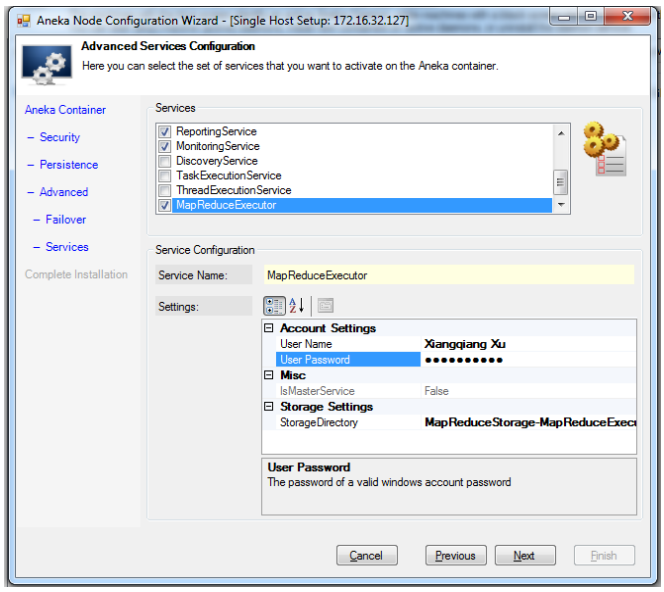


Click **Next**, we need to configure some information. I take MapReduce as an example here.

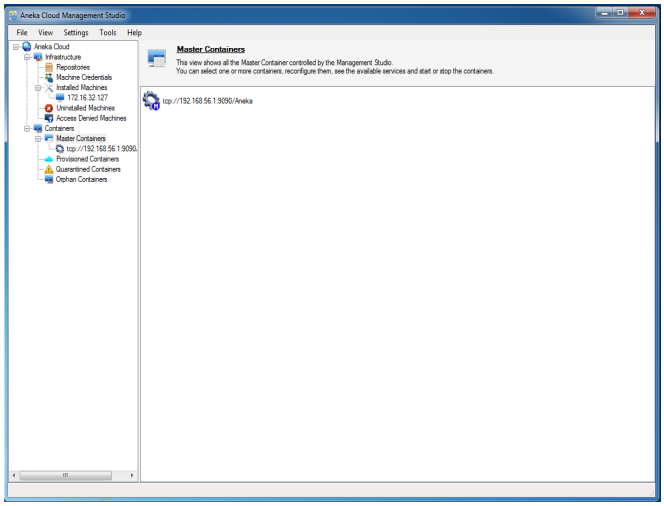
User Name and User Password are the same with your system username and password.



The step above aims to add the current machine as a MapReduce Scheduler. If you just use one machine in local, you can add this machine as a MapReuce Executer as well.

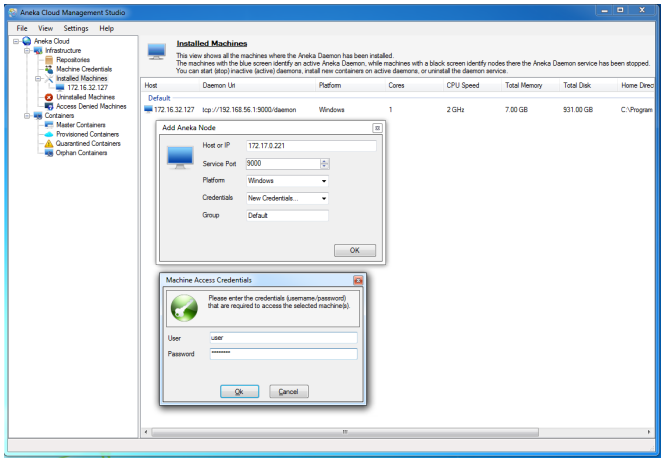


Click **Next** to finish the configuration. Here is what it looks like:



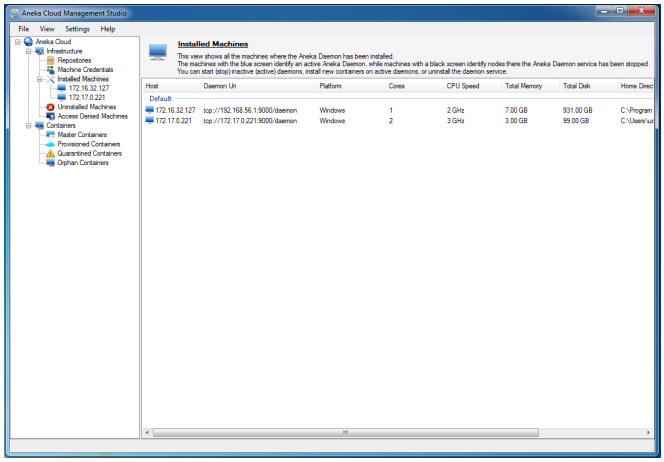
6.2. Install one machine as master container node, and install other machines as worker container nodes. (You can install multiple worker container nodes. Here I just install one worker container node as an example)

First, add a new machine with IP address (172.17.0.221) to our Aneka.

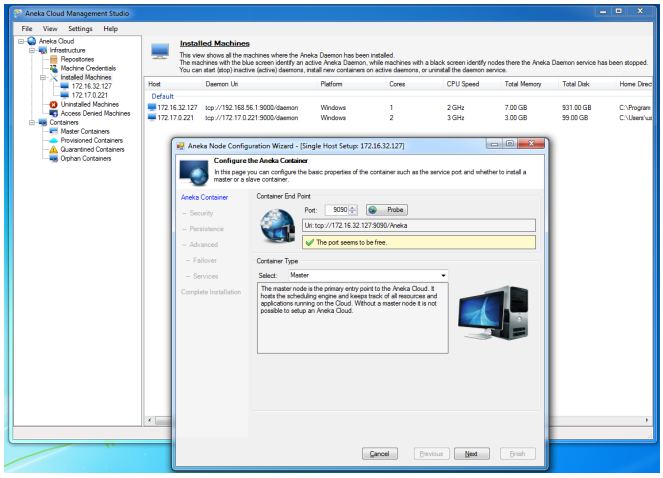


Click **OK** to continue to add it to Aneka. Then it should show up as follows:

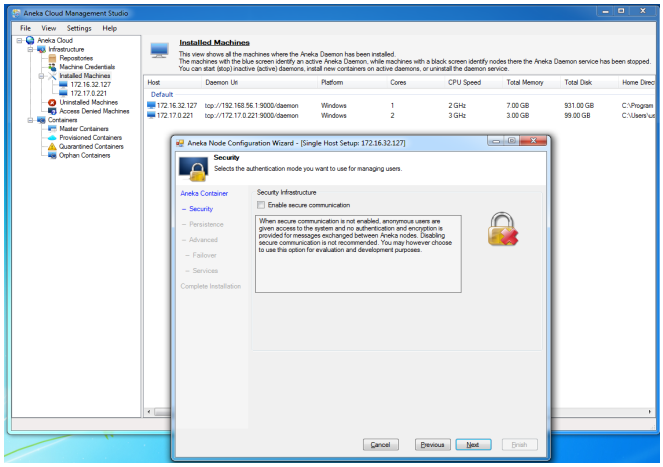
If the machine is grey, you can right click the icon, and click start to launch the machine.



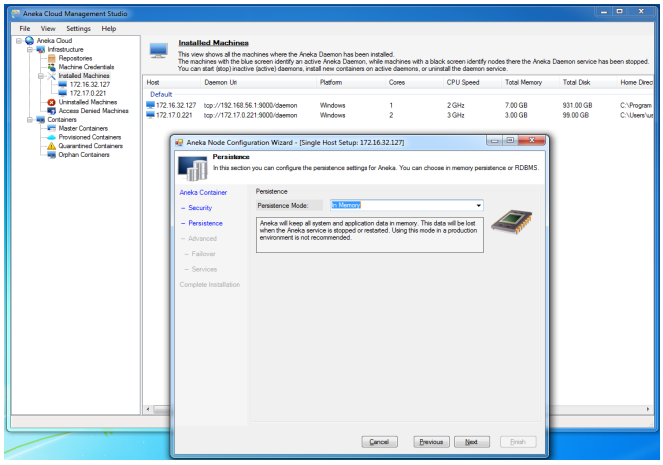
After that, install master container on one machine. Right click the machine icon, and click install container. Now the Container Type is **Master**.



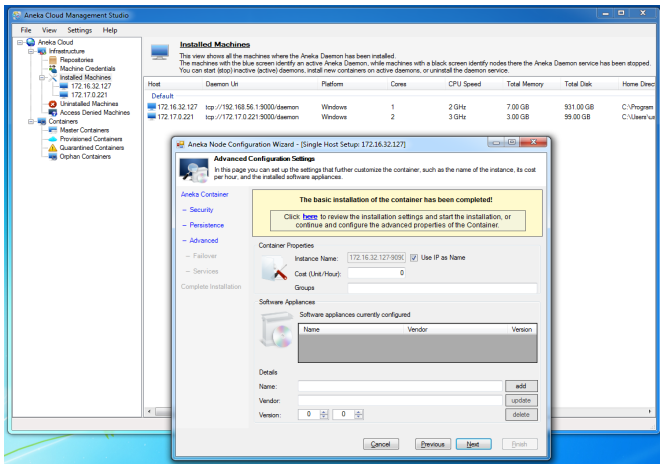
Click **Next**.



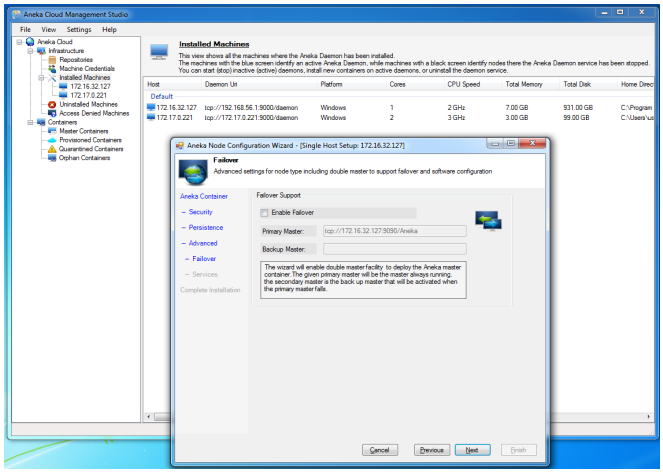
Click **Next**, and choose Persistence Mode as **In Memory**.



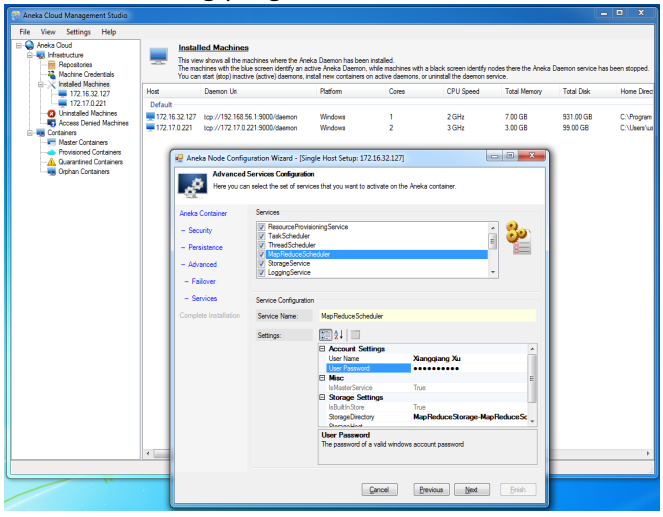
Click **Next**.



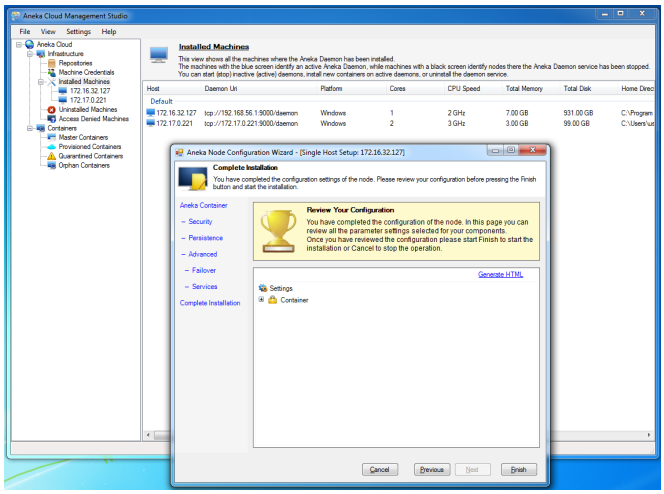
Click **Next** again.



Click **Next**, and configure the MapReduce Scheduler with User Name and User Password.
User Name: Xiangqiang Xu User Password: ******

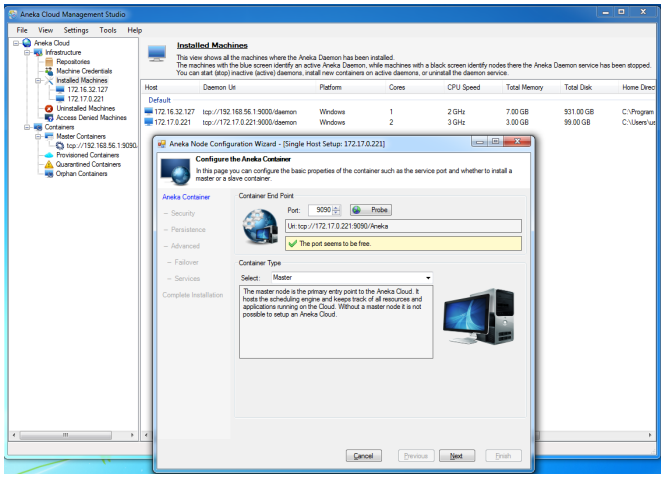


Click **Next**, then click Finish. Now, the master container has been installed.

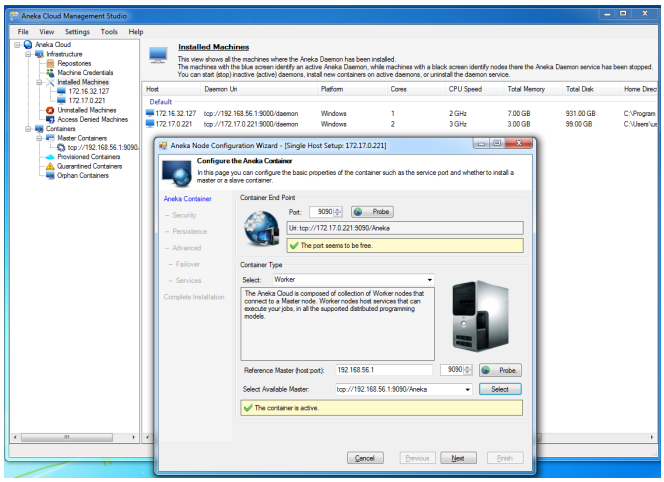


Next, install worker container with another machine based on the master container.

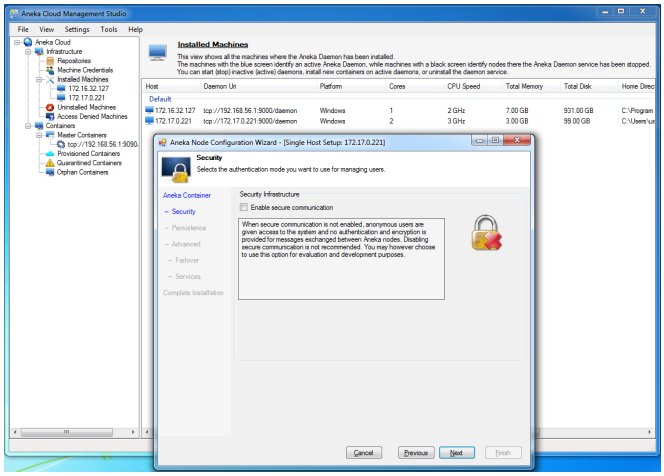
First, click another machine IP icon, and right click **Install Container**.



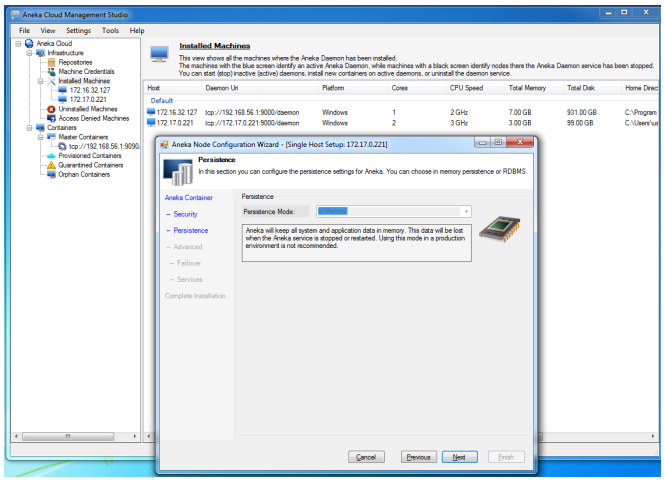
The worker container is built on top of the master container. Choose Container Type as **Worker**. Click **Select**. If ports are free and the container is active, that means the confirmation is correct. It shows up as follows:



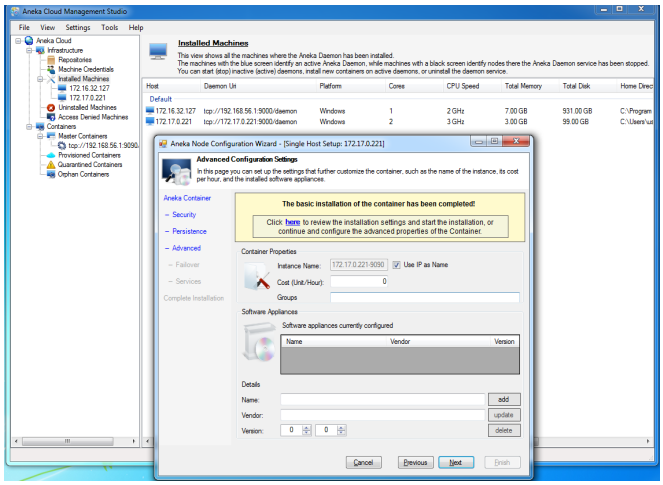
Click **Next** to continue.



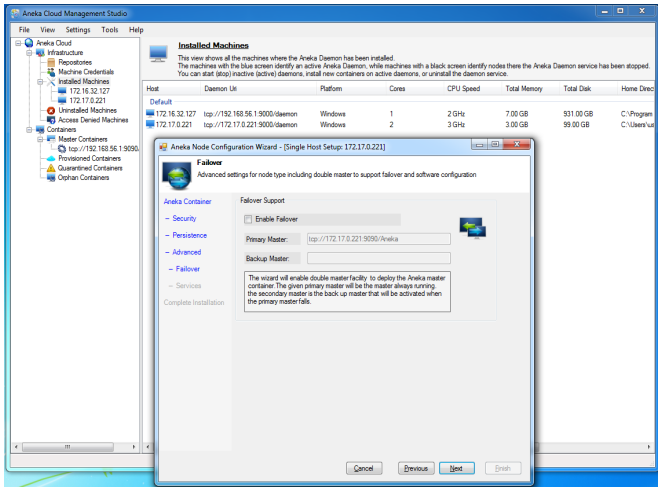
Click **Next** to continue.



Click **Next** to continue.

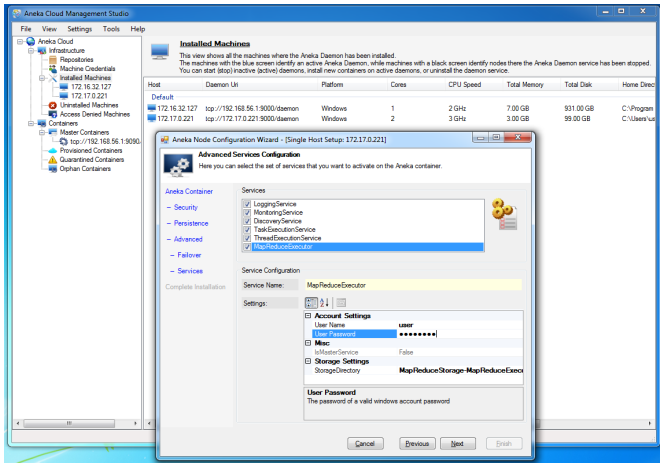


Click **Next**.

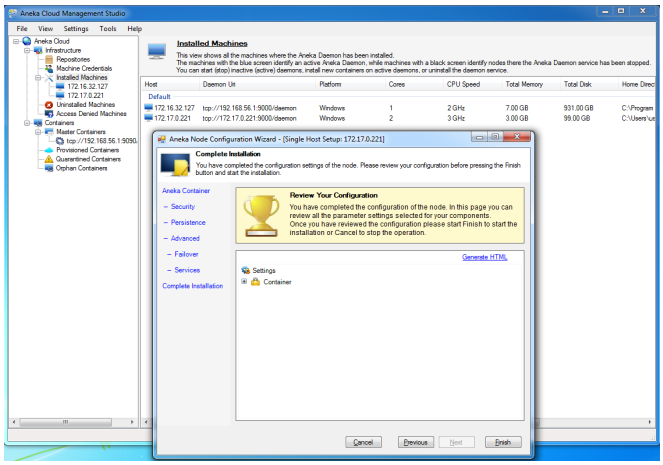


Click **MapReducerExecuter**, fill in the User Name and User Password.

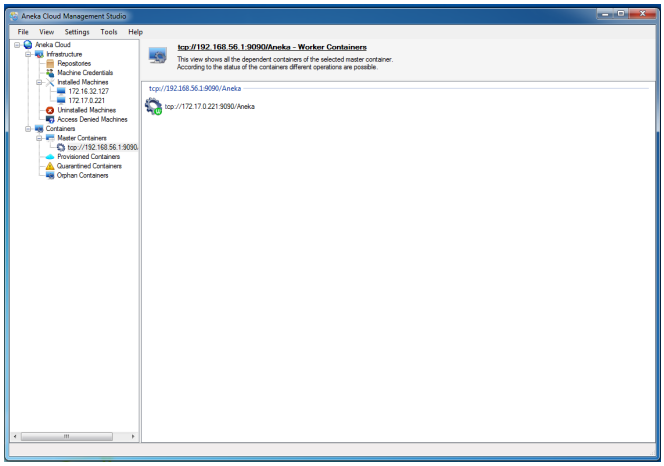
My case is User Name: **user** User Password: **userpass**



Click **Next**, then click **Finish**. Now, the master container has been installed.



Ok, now, both master container and worker container are installed successfully.



7. After installation, you can run MapReduce example code in the following directory:

C:\Program Files (x86)\Manjrasoft\Aneka.3.0\Examples\Tutorials\MapReduce Model\CSharp

Currently, we can code in C# or VB.NET for Aneka programs. I recommend to code in C#, which is very similar to Java. You can use Microsoft Visual Studio (I use Microsoft Visual Studio 2012 Professional) to run and code.

8. When you run example code, you need to add reference .dll to your code. Those .dll files can be found at: C:\Program Files (x86)\Manjrasoft\Aneka.3.0\Tools\SDK

Especially, for MapReduce model programming, those .dll files can be found at:

C:\Program Files (x86)\Manjrasoft\Aneka.3.0\Tools\SDK\Common

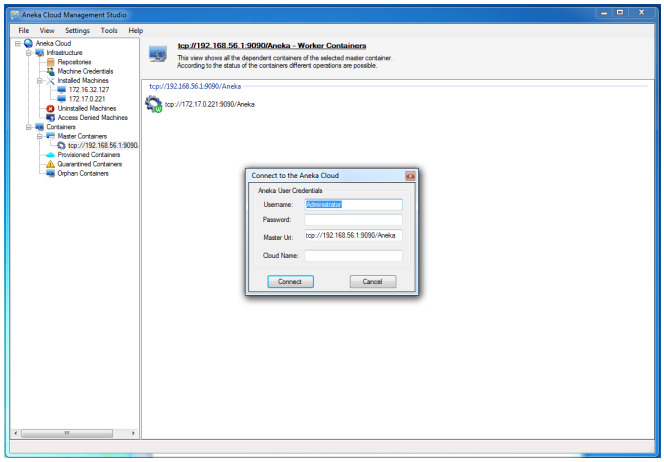
C:\Program Files (x86)\Manjrasoft\Aneka.3.0\Tools\SDK\MapReduce Model

9. Some related manuals and documents can be found at:

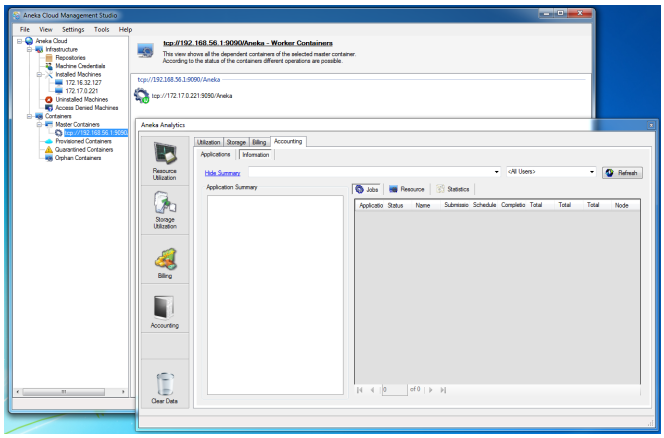
C:\Program Files (x86)\Manjrasoft\Aneka.3.0\Docs\Manuals

10. Besides, when you run examples, you can use Aneka Analytics to obtain more information:

Click **Aneka Cloud Management Studio** →**Tool** → **Connect**



Click **Connect**, then you can get more details about your running jobs.



11. For more details, you can read from the following links:

Installation Guide: http://www.manjrasoft.com/download/3.0/AnekaInstallationGuide.pdf

MapReduce Model Tutorial: http://www.manjrasoft.com/download/3.0/MapReduceModel.pdf

Aneka User Documents and Programming Models - Example Code:
http://www.manjrasoft.com/manjrasoft_downloads.html

12. Amazon EC2 Setup

There is a useful link about Amazon EC2:

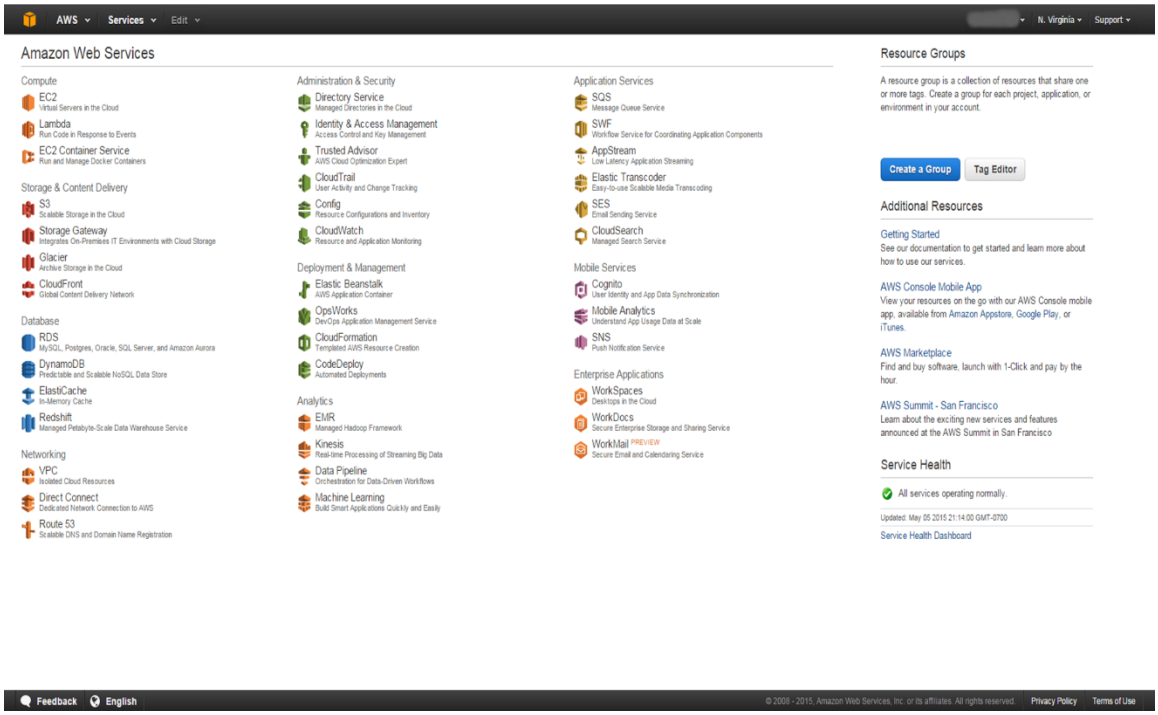
https://aws.amazon.com/documentation/ec2

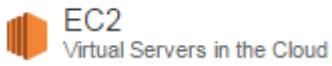
If you use Microsoft Windows, the link bellow might be helpful:

http://docs.aws.amazon.com/AWSEC2/latest/WindowsGuide/concepts.html

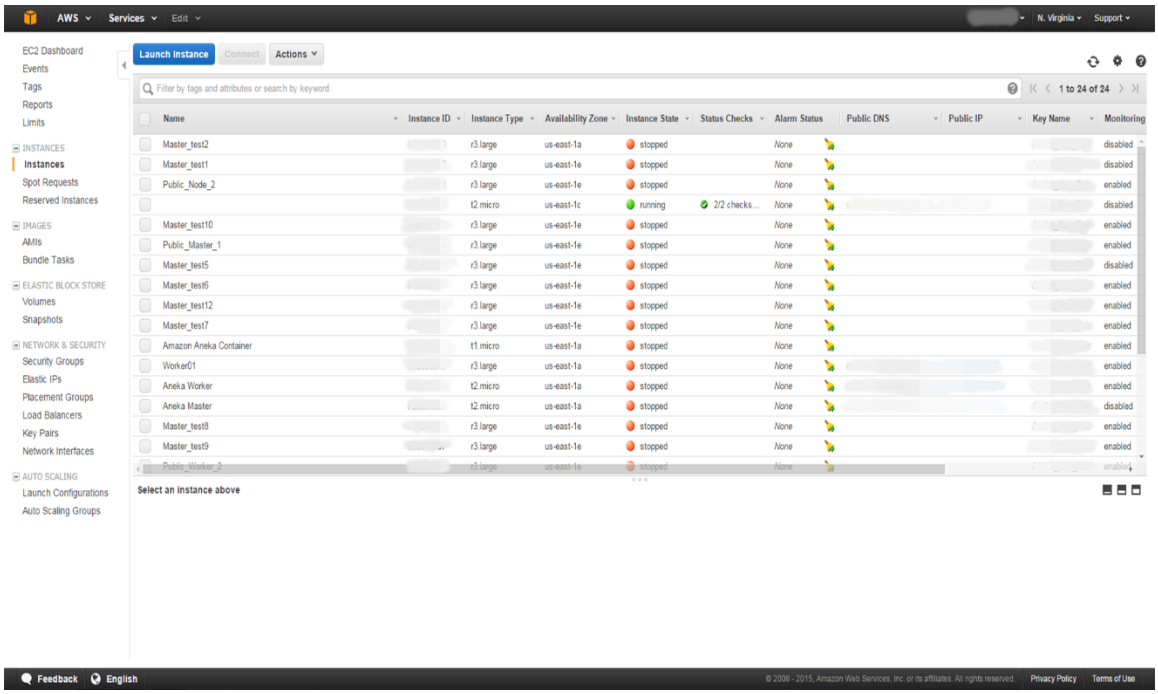
Login from here: https://aws.amazon.com

Then you will see this panel:

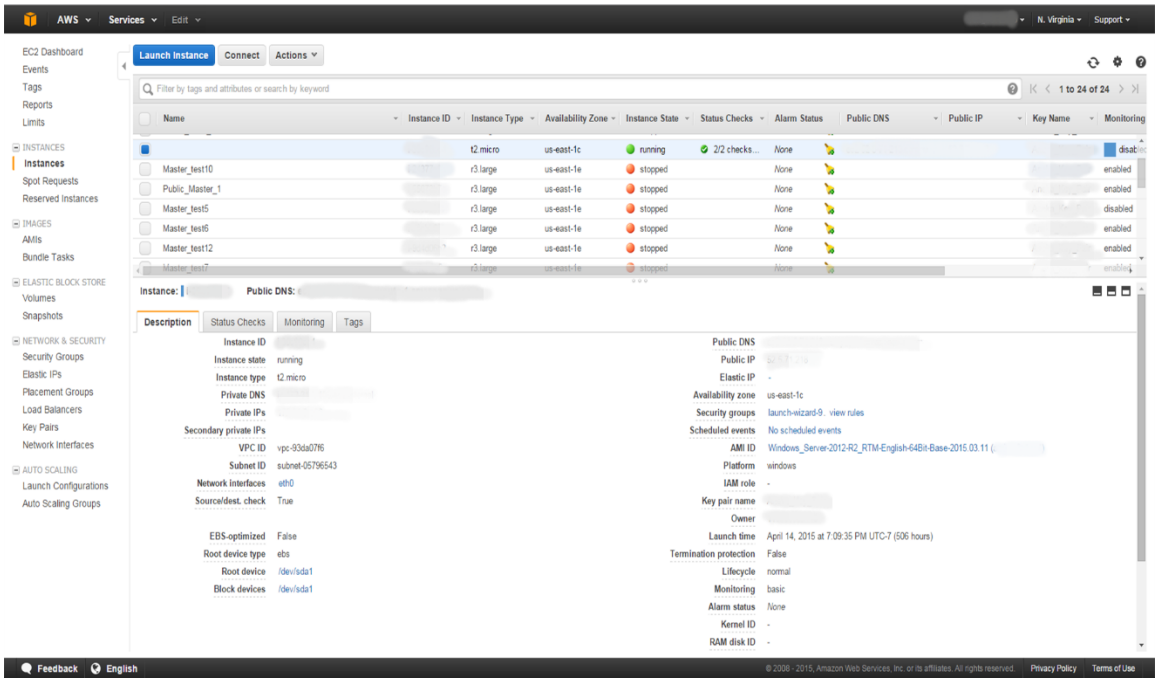


Click the first EC2 icon: 

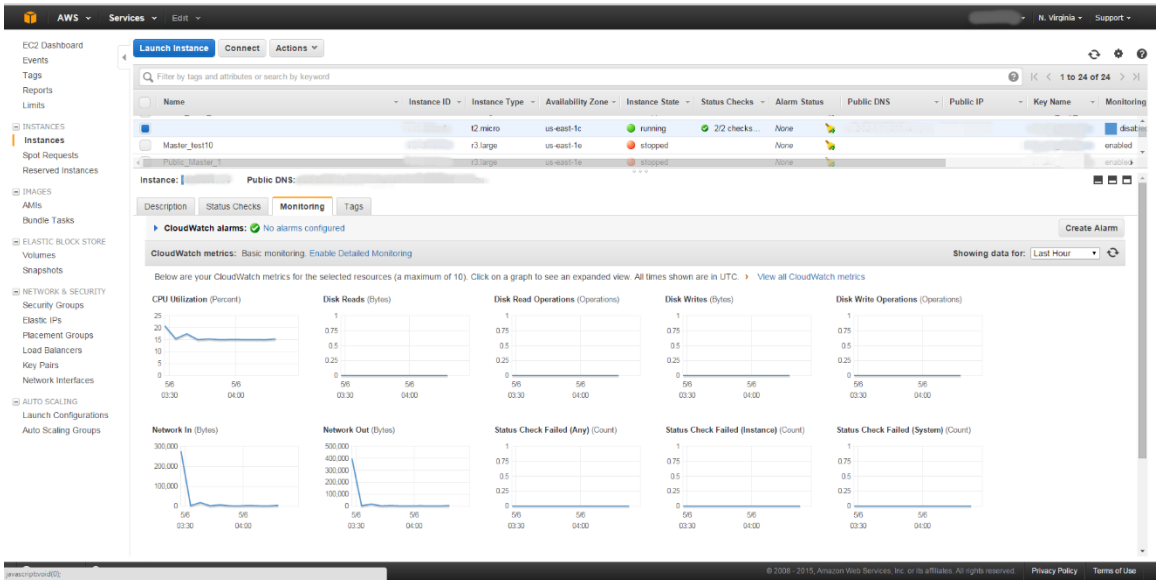
Then you can see this panel, you can launch new instance or start the current instance.



You can get more detailed information if you look at the bottom of the webpage:



Also, below are your CloudWatch metrics for the selected resources.



Here is some simple explanation of related parameters:

(1). AMIs: you can backup OS image or launch clone a new instance base on the image.

(2). Volumes: storage size you can set up.

(3). Security Groups: you can configure different security rules. Then each instance can be assigned to different Security Groups if you want.

(4). Elastic IPs: since every time you start a new instance, or you restart an instance, its IP address will change. You can associate a static IP address to the instance, so that your IP address will not be dynamic.

(5). Key Pairs: You need Key Pairs to login the instance, and decrypt to get instance password.

Note: If you just want to stop the AWS service for a while, click the corresponding instance, and right click, and choose stop. Then you will not be changed of hourly fees. And your data and information will be kept for you.

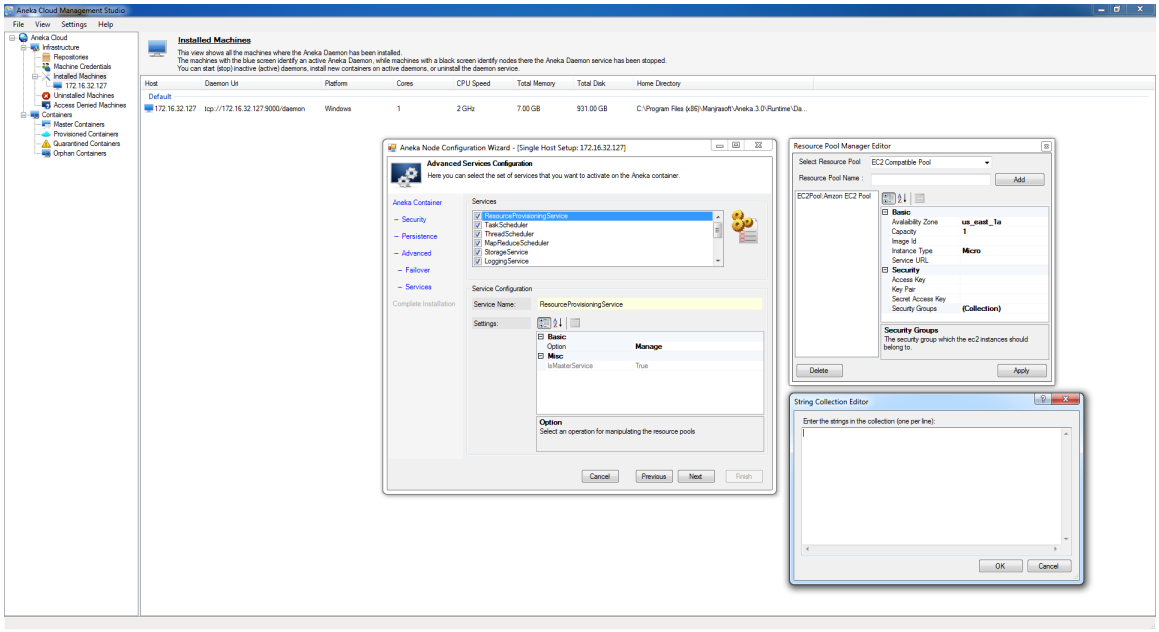
But if you want to permanently stop the instance, you can click the corresponding instance, and right click, and choose terminate. In this case, the instance will be recycled, and all your data will be removed. **BE CAREFULLY USING TERMINATE!**

Appendixes - 1

- Q&A about Dynamic Provisioning on Aneka -

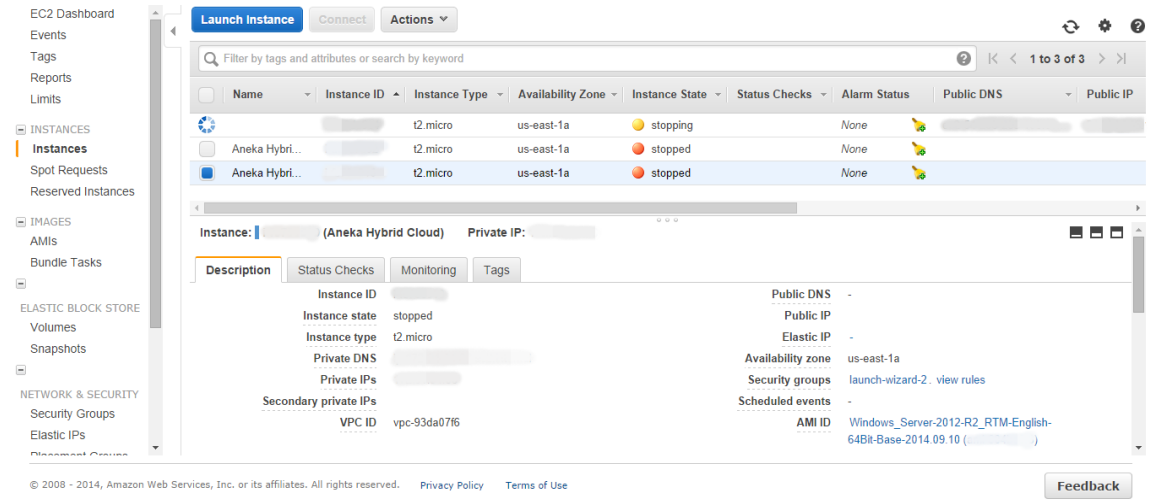
Here are some QAs for Aneka Dynamic Provisioning and the red texts below are the answer.

(**Note:** More detailed steps can be seen from the attached video which shows how to setup Resource Manager Pool and how to create Aneka hybrid cloud on Amazon EC2.)



Q1. Image ID: do I need to fill in Instance ID such as **i-ab12c345**, or **AMI ID** such as **Windows_Server-2012-R2_RTM-English-64Bit-Base-2014.09.10 (ami-123ab4c5)**, or **AMI ID** the value in brackets such as **ami-123ab4c5**? See the screenshot below.

A: The AMI ID such as **ami-123ab4c5.**

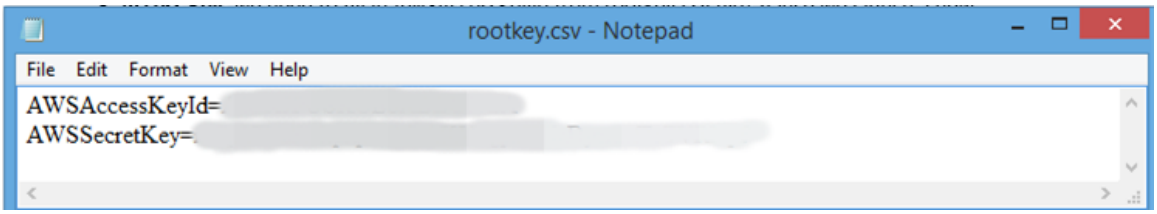


Q2. Service URL: our Available Zone is **us-east-1a**, so just leave it blank should be fine, right?

A: Yes.

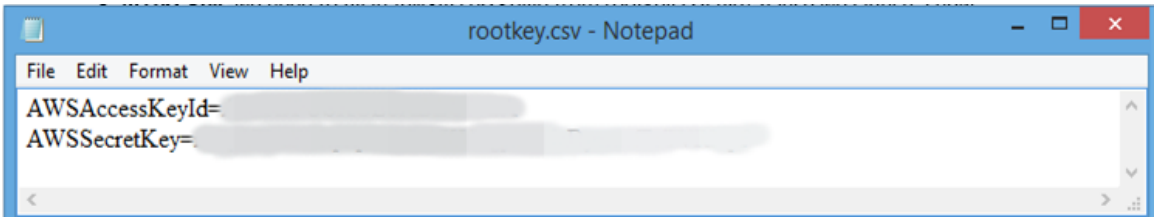
Q3. Access Key: do I need to fill in AWSAccessKeyId such as **XXXXXXXXXXXXXXXXXXX** from rootkey.csv file? (Once we launch a new instance, we can download a rootkey.csv file). See the screenshot below.

A: Yes.



Q4. Secret Access Key: do I need to fill in AWSSecretKey such as **XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX** from rootkey.csv file? (Once we launch a new instance, we can download a rootkey.csv file). See the screenshot below.

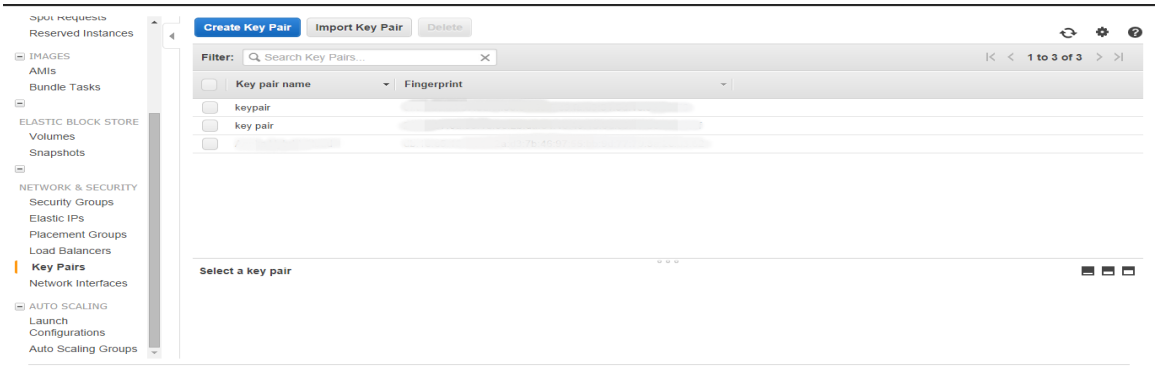
A: Yes.



Q5. Key Pair: do I need to fill in the value we need to fill in is **Key pair name** or **Fingerprint**?

For example, **Key pair name** is **Aneka Hybrid Cloud**

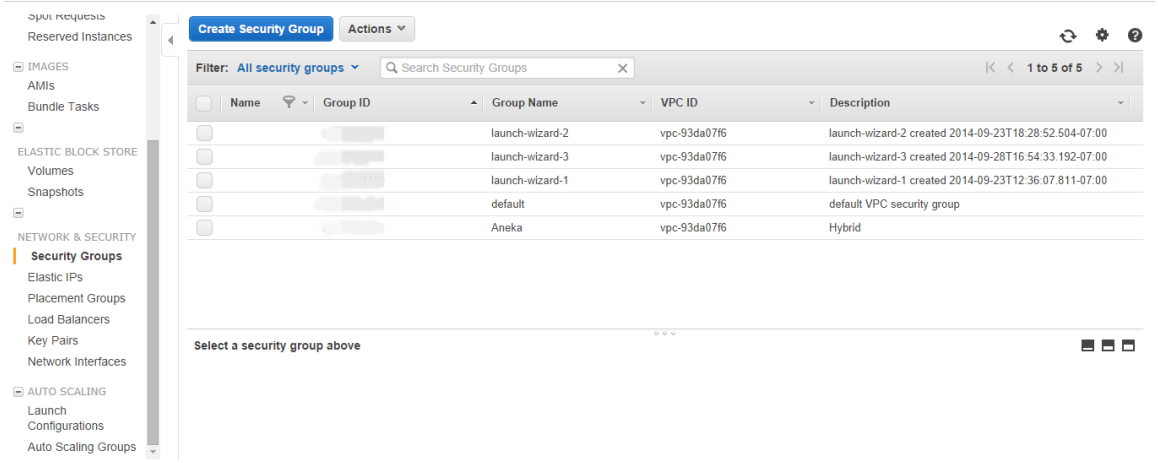
Fingerprint is **db:1a:a1:12:1b:1c:2a:b3:7c:45:67:89:bb:1a:11:12:1a:2b:d3:45**



A: Key Pair, but this is not compulsory.

Q6. Security Groups: do I need to fill in Group ID such as **sg-1abcd234** or **Group Name** such as **launch-wizard-2**? See the screenshot below.

A: Group Name.

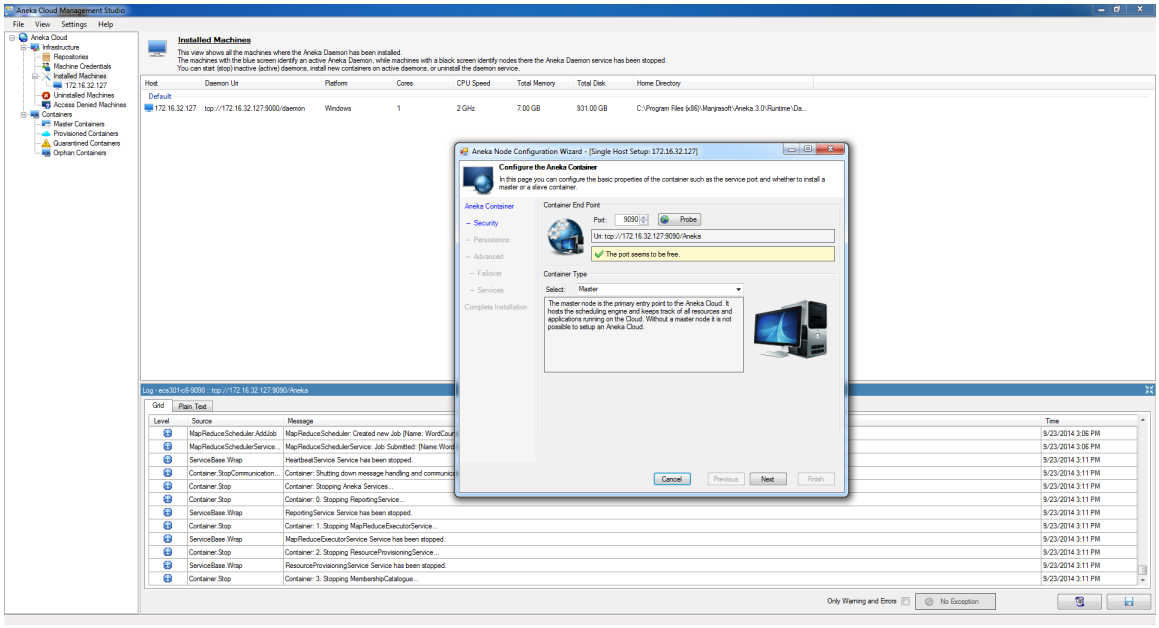


Appendixes - 2

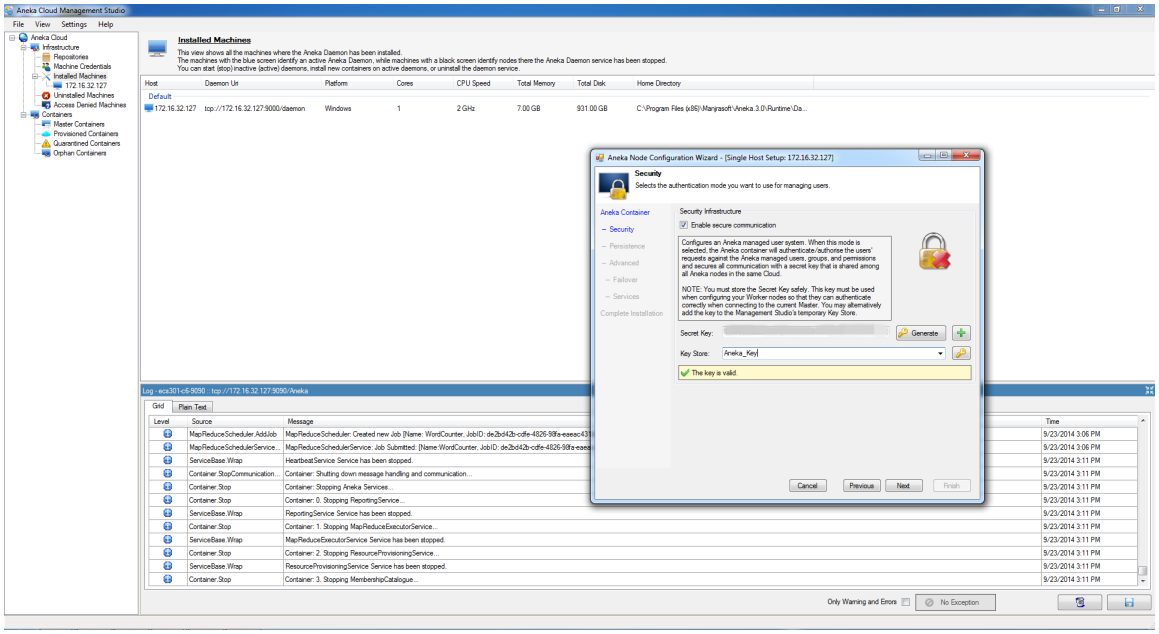
- How to setup and configure Dynamic Provisioning on Aneka? –

(**Note:** More detailed steps can be seen from the attached video which shows how to setup Resource Manager Pool and how to create Aneka hybrid cloud on Amazon EC2.)

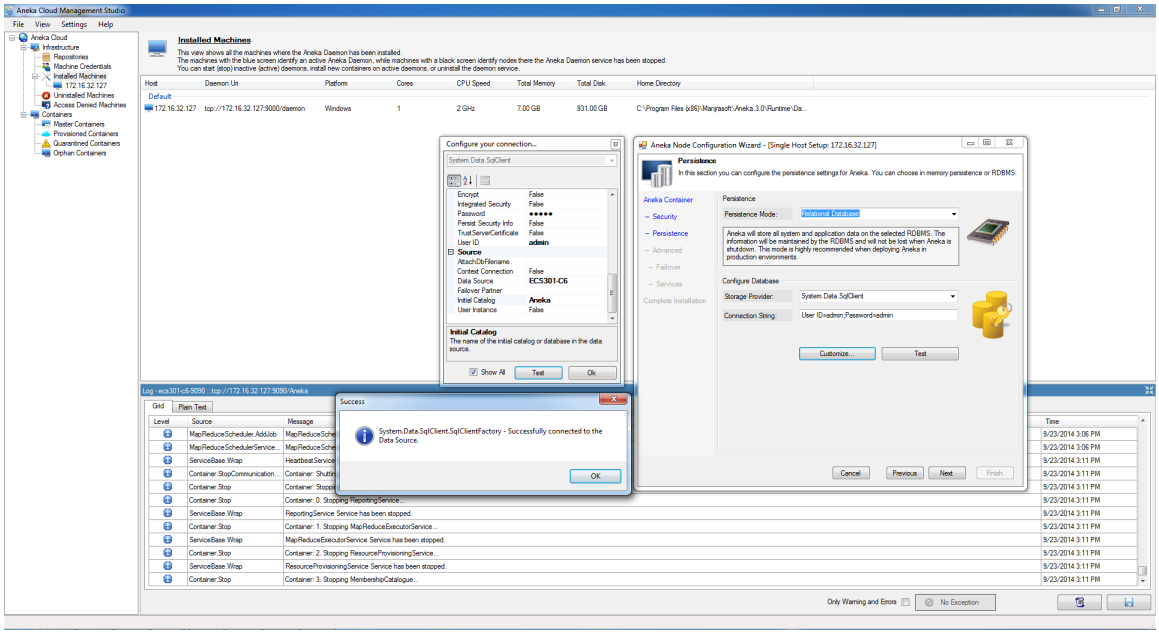
Step 1. Configure the Aneka Container.



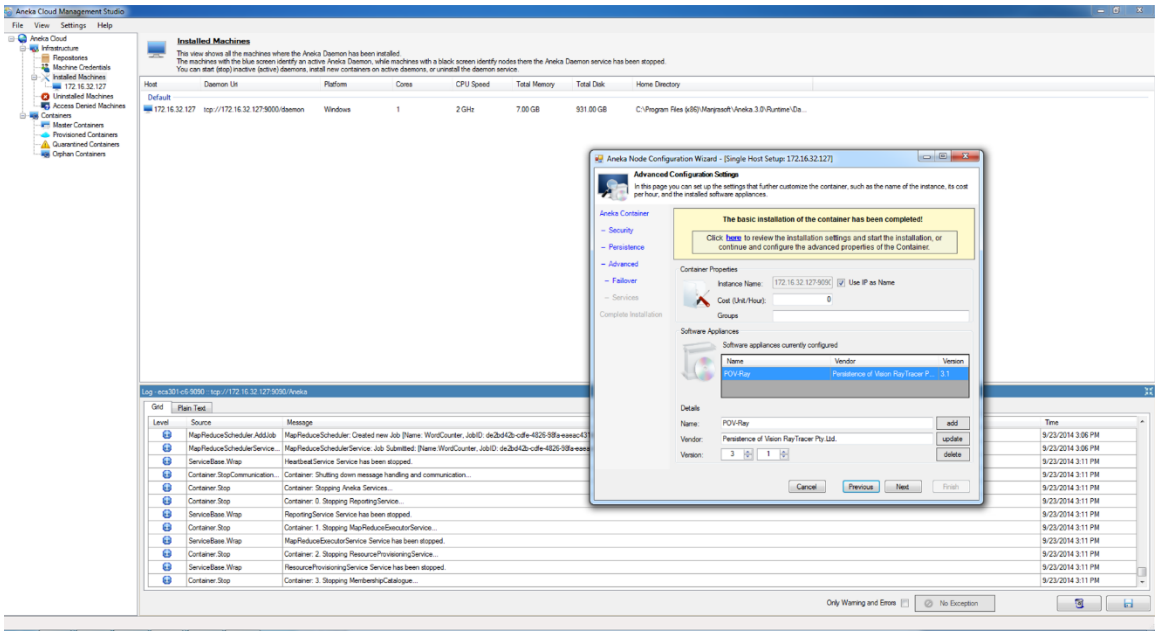
Step 2. Security.



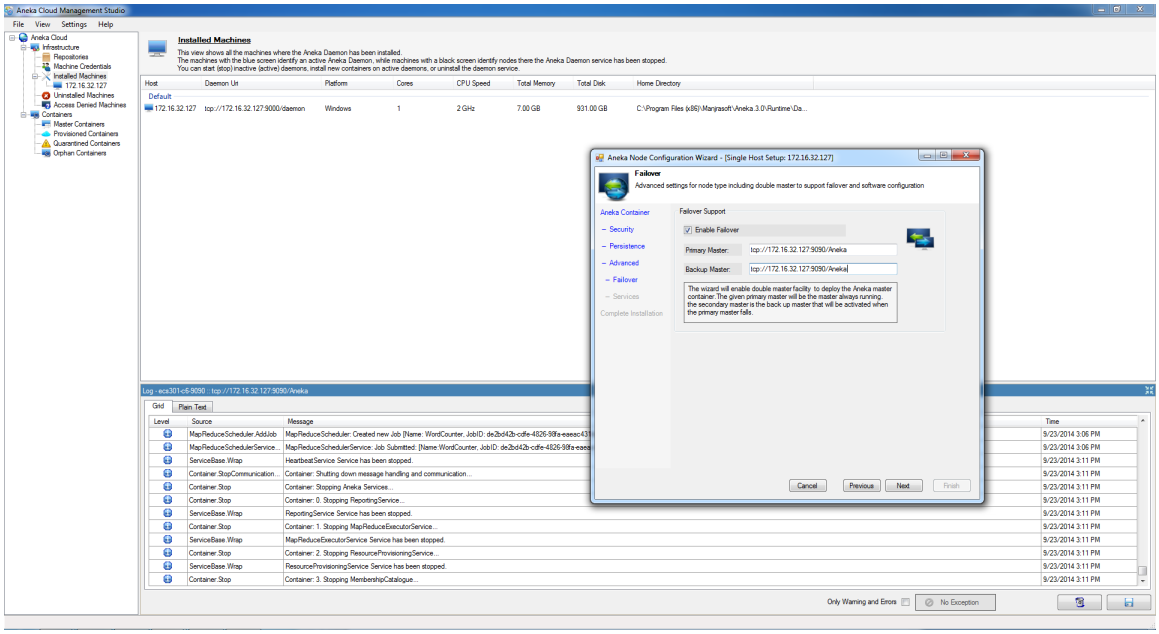
Step 3. Persistence.



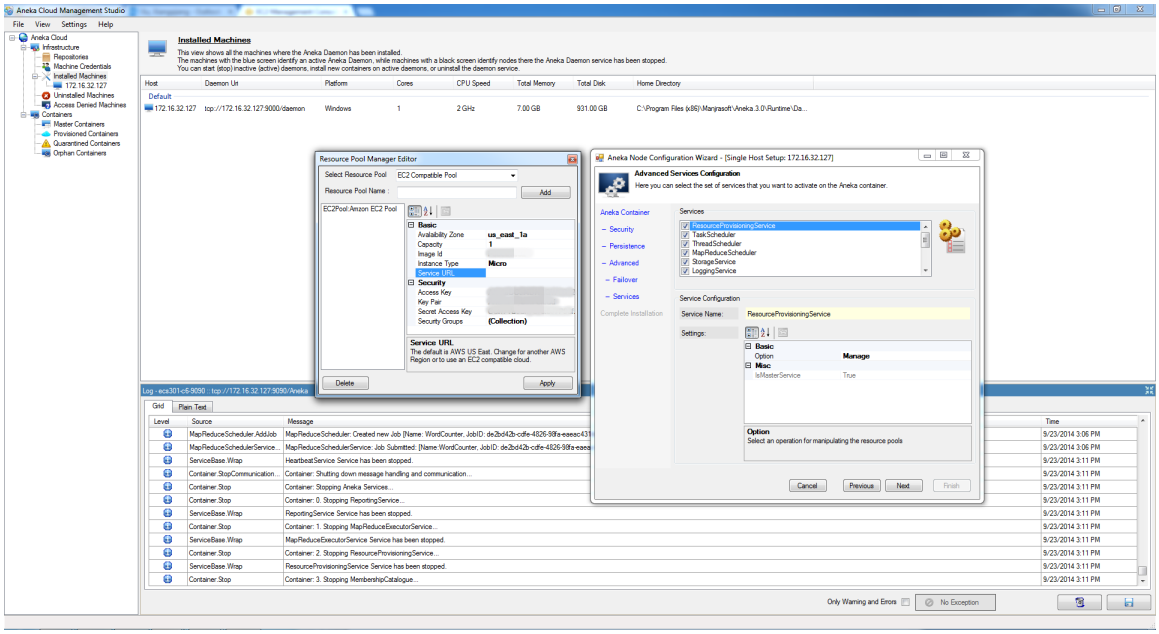
Step 4. Advanced Configuration Settings.



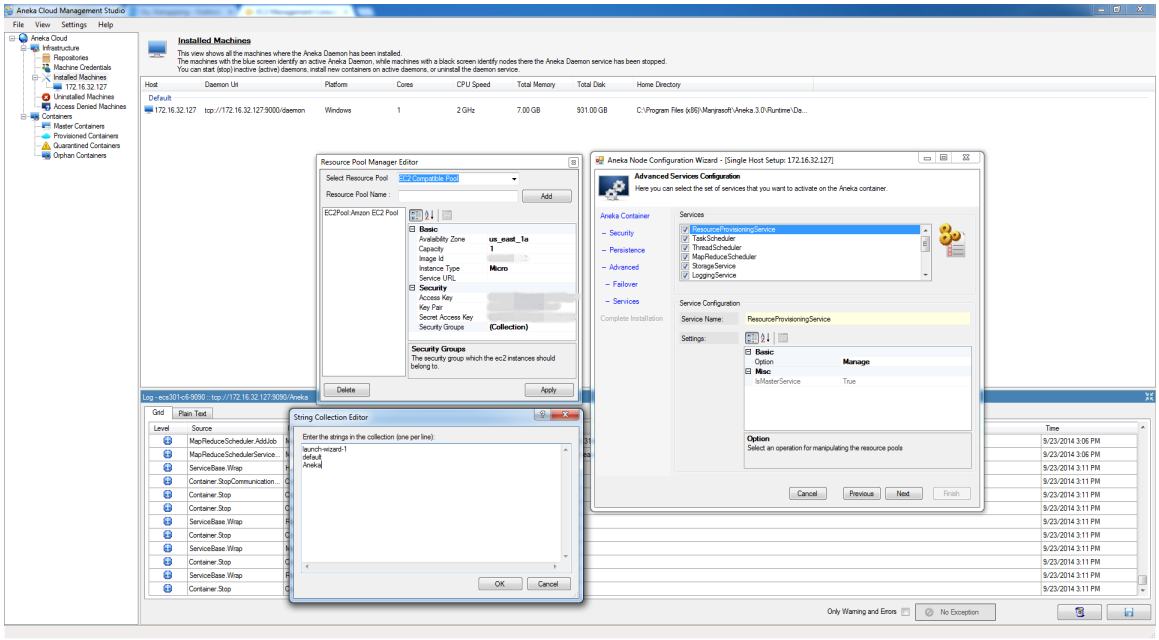
Step 5. Failover.



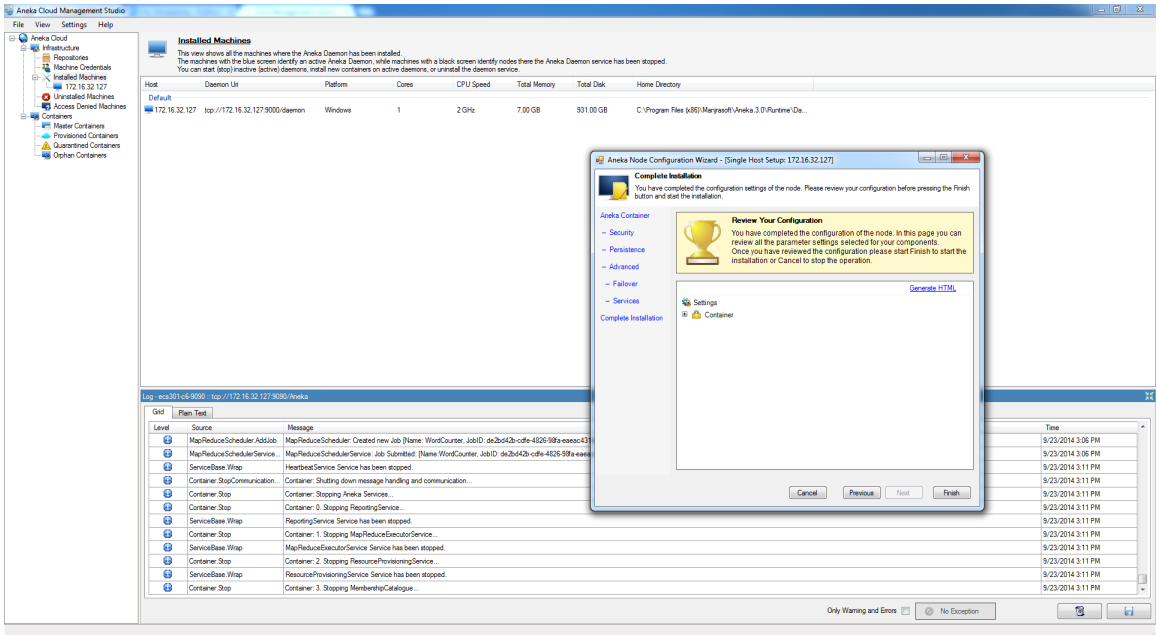
Step 6. Advanced Service Configuration -> Resource Provisioning Service -> Resource Pool Manager Editor



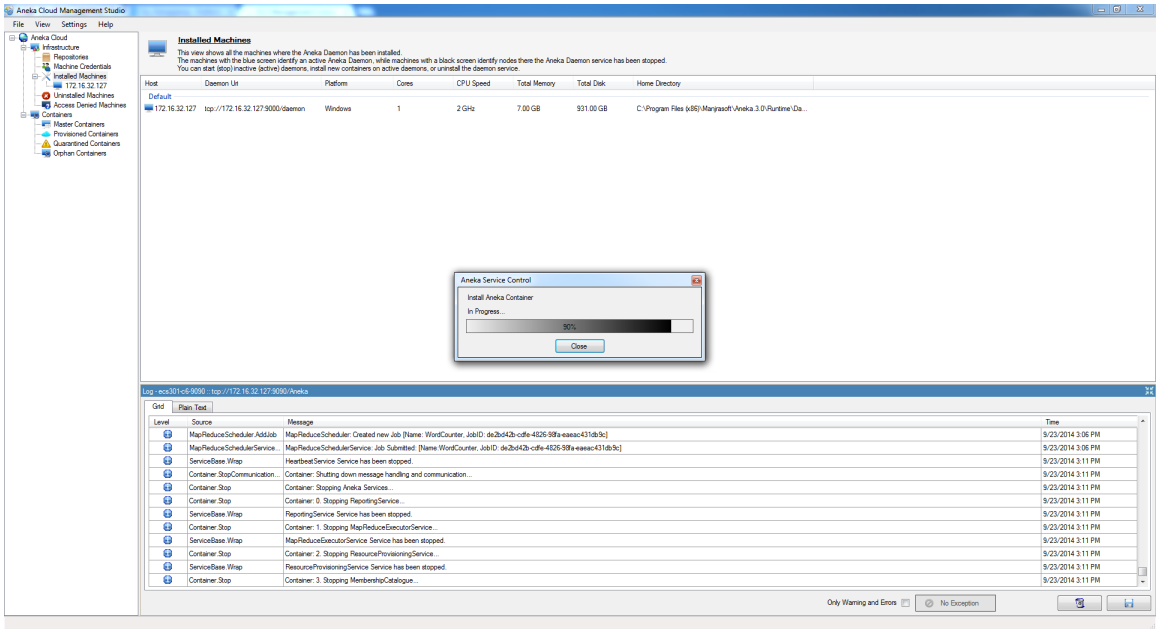
Step 7. Security Groups (Collection).



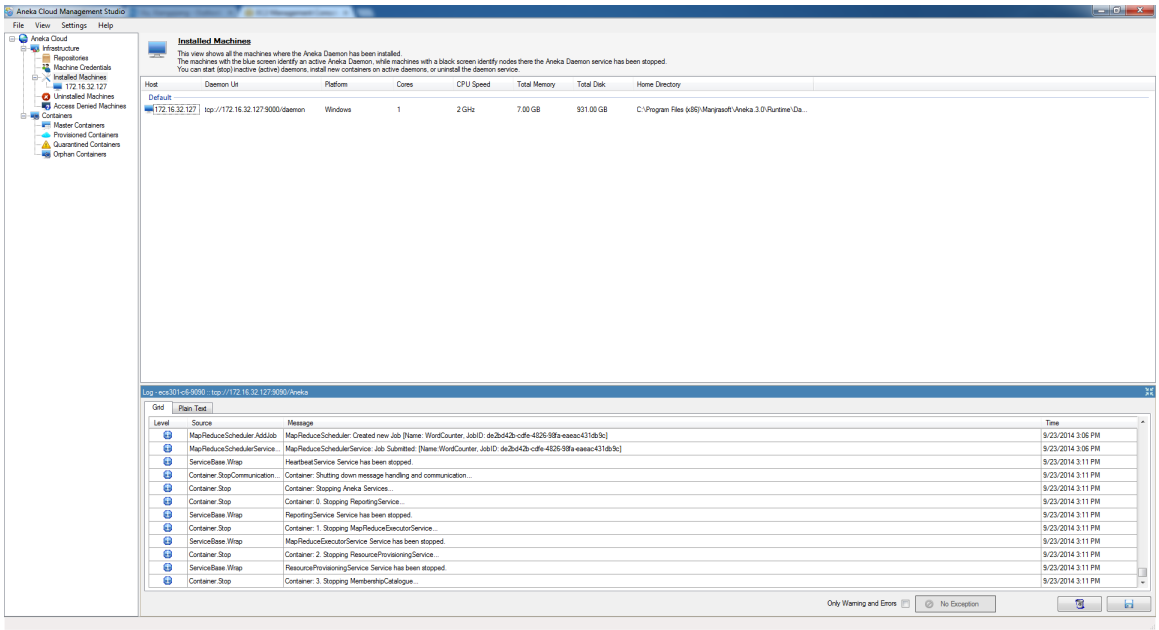
Step 8. Completion Installation.



Step 9. Install Aneka Container in process.

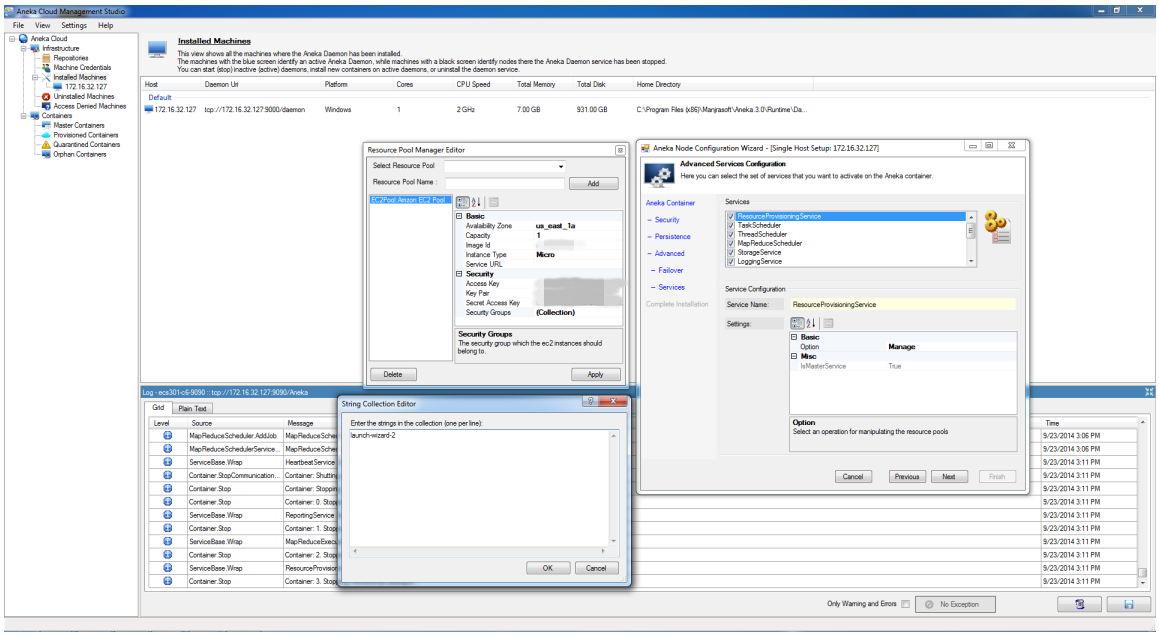


Step 10. Complete installation without any notification/error, but no Master Container appears.

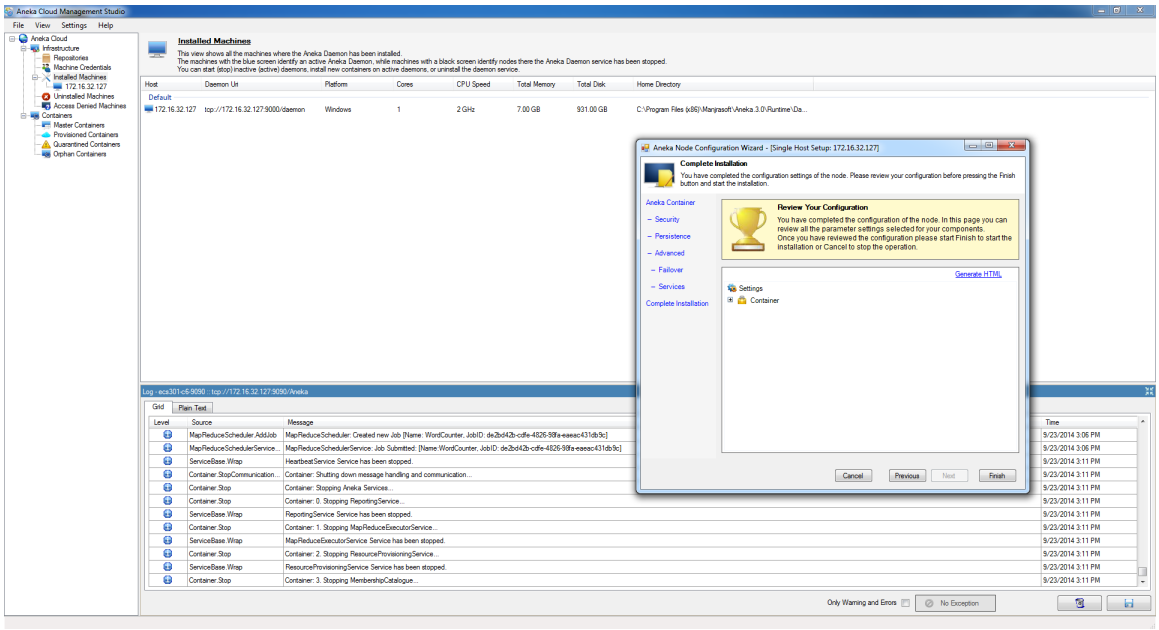


Also, I tried to the whole process again by only changing Image ID showed in Step7 to ami-904be6f8 showed in step 11. The previous steps are the same, and step 11-14 are the following steps after changing Image ID.

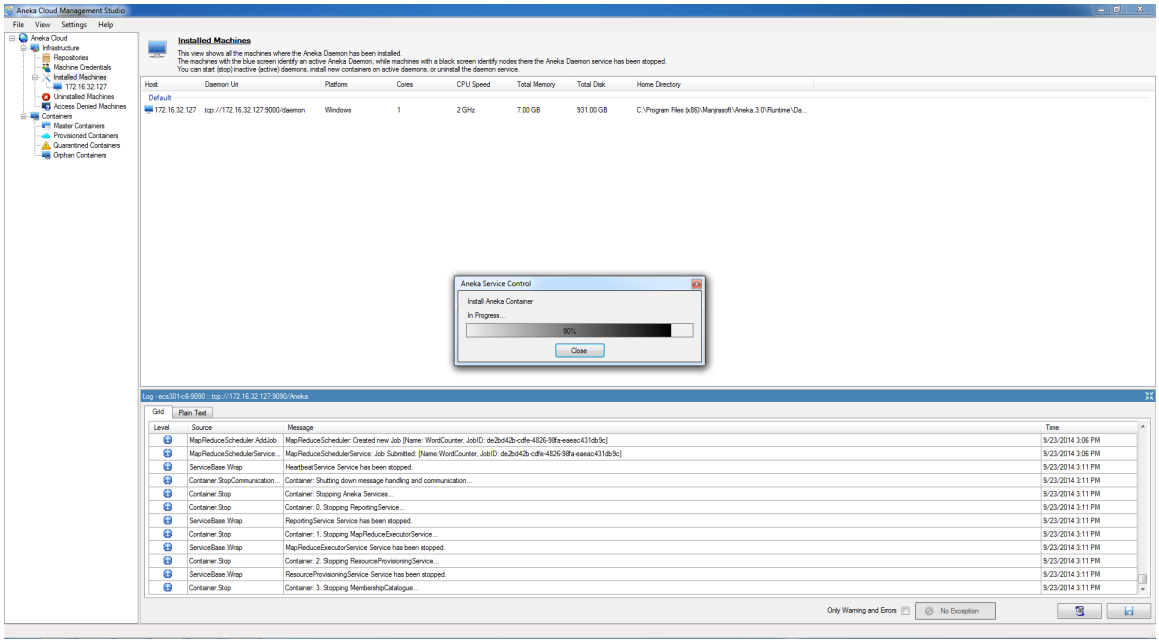
Step 11. Advanced Service Configuration -> Resource Provisioning Service -> Resource Pool Manager Editor -> Security Group (Collection)



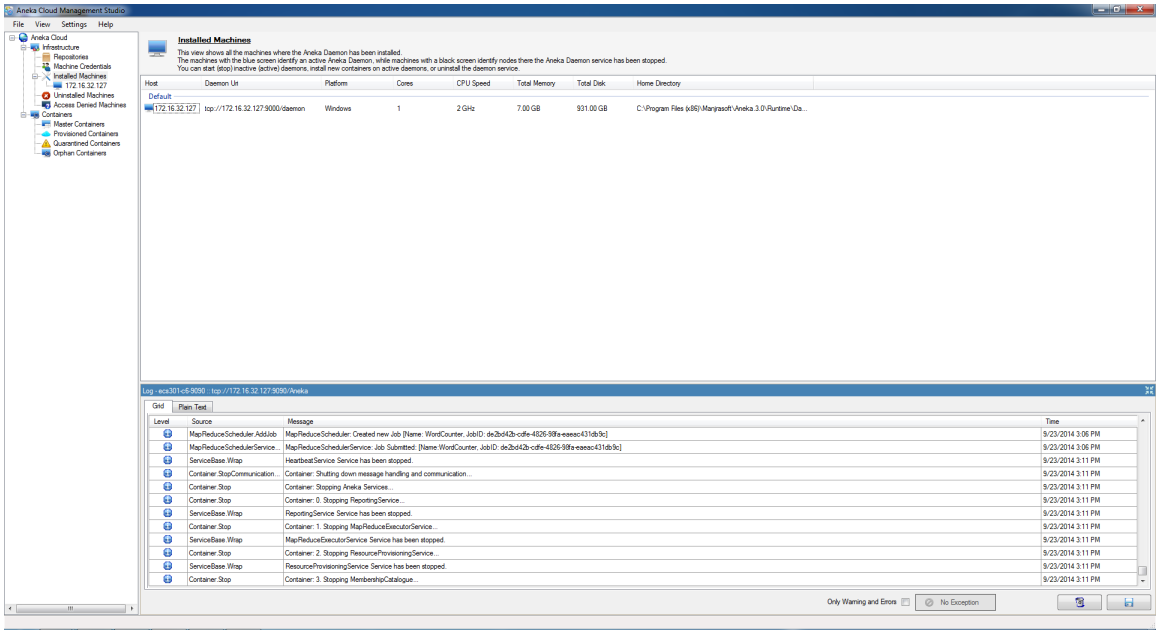
Step 12. Completion Installation.



Step 13. Install Aneka Container in process.

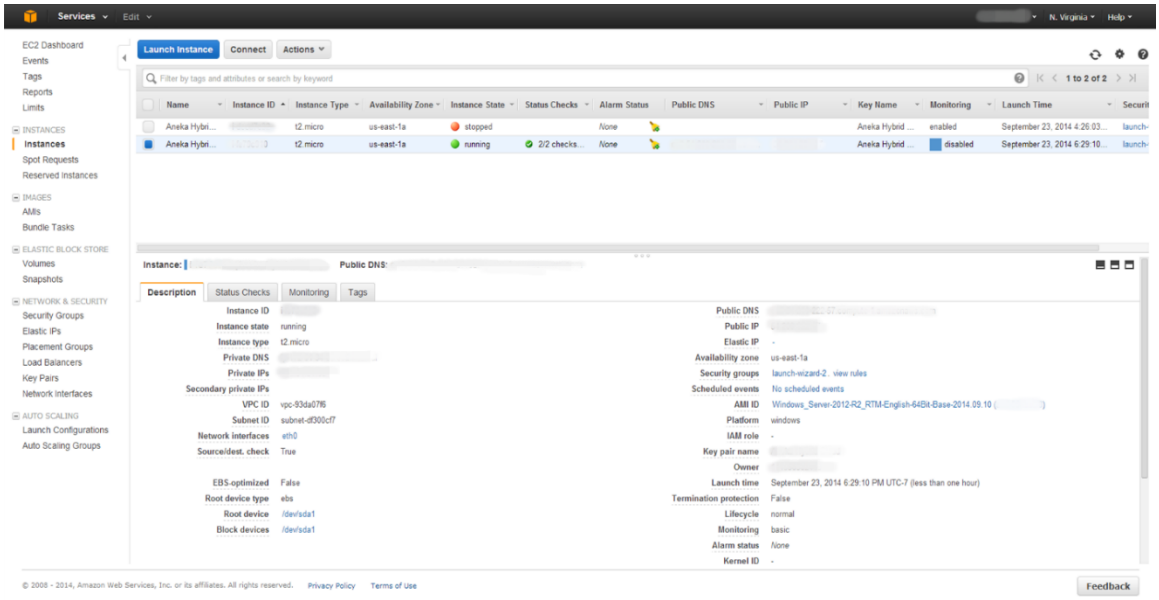


Step 14. Complete installation without any notification/error, but no Master Container appears.

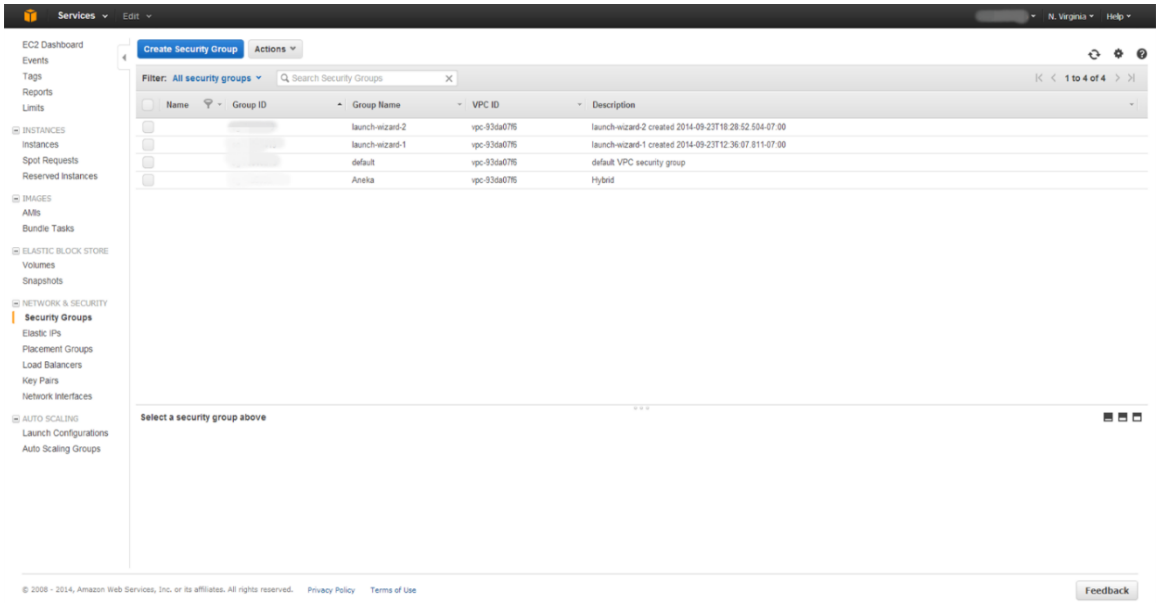


AWS-info 1 to AWS-info 4 is our specific AWS account set-up information including Instances, Image ID, Key Pairs, Security Groups, Access Key ID and Secret Access Key:

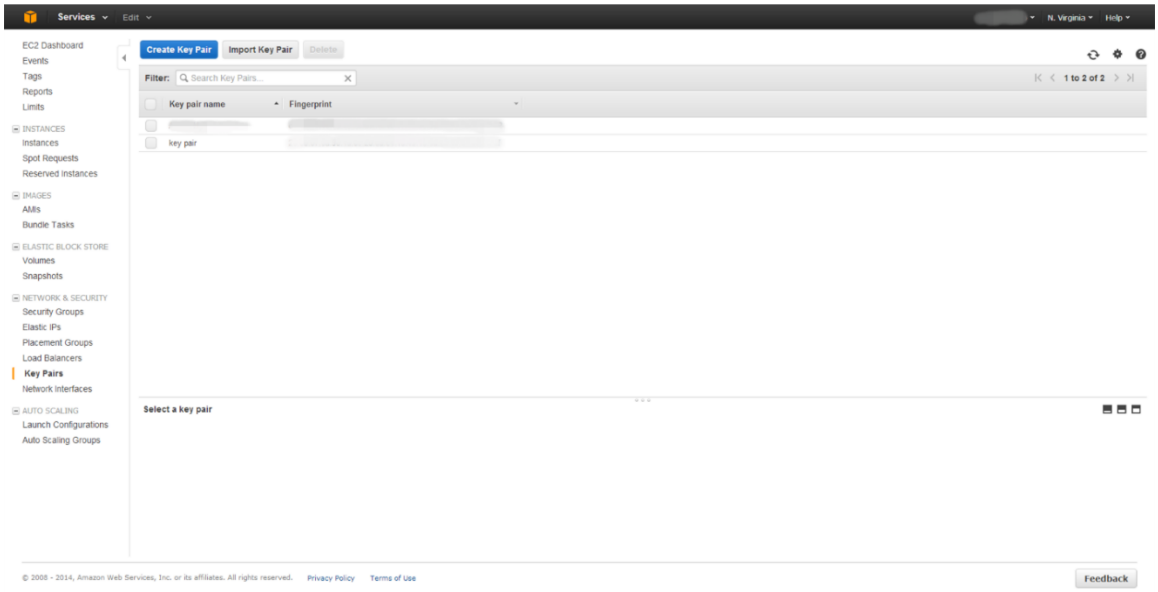
AWS-info 1. Instances.



AWS-info 2. Security Groups.



AWS-info 3. Key Pairs.



AWS-info 4. Security Credentials.